JOINT CANNERY OCEAN DUMPING STUDIES

IN

AMERICAN SAMOA

Submitted to

U.S. Environmental Protection Agency, Region 9
American Samoa Environmental Protection Agency

Prepared for

StarKist Samoa
(Permit OD 93-01 Special)
and
VCS Samoa Packing
(Permit OD 93-02 Special)

Prepared by

CH2M HILL

and

Glatzel & Associates

July 1996

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ► 3

To Mohamed Abdelrhman	From Allan Ota
Dept./Agency ORD	Phone # 415-744-1980
Fax # 401-782-3030	Fax # 415-744-1078

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Executive Summary

The ocean dumping permits issued to StarKist Samoa and VCS Samoa Packing require a variety of monitoring and reporting activities. One such activity is a re-evaluation of previous bioassay testing and dispersion modeling reported in previous studies. This activity is described in special condition 3.3.5 of the permits issued to each of the canneries. This report presents the results of the bioassay tests and modeling done under this special condition.

High strength waste, to be disposed of by ocean dumping, was sampled from each cannery as it was transferred to the FV *Tasman Sea*. Samples were taken three times, during various seasons of the year, and shipped to Advanced Biological Testing (ABT) in Tiburon, California. At ABT bioassays were conducted with a number of test organisms as required by the permits. The methods and test species used were modified in consultation with USEPA as the study progressed. The lowest LC50 recorded in the series of bioassays was 0.12 percent.

The previous modeling was done during the preparation of an Environmental Impact Statement done by U.S. Environmental Protection Agency. This modeling was reviewed and evaluated. CH2M HILL used a different approach to estimate an initial dilution (consisting of an immediate dumping dilution and a nearfield dilution). The two components of the initial dilution were based on propeller theory and the concept of a momentum jet. The farfield dilution was based on the same model (mathematical and physical description) previously used, but implemented with a spreadsheet application.

The results of the model, although considered quite conservative, indicated somewhat higher dilutions at the edge of the dumping zone than previously predicted by the model used in the FEIS. Direct comparisons cannot be made since the vessel in use is not the same. However, predictions for the worst case, corresponding to average ocean currents, in the summer, and at maximum discharge rate, indicate a concentration at the edge of the dumping zone that is 0.0021·(LC50) described above.

Contents

PACIFIC DAILY NEWS, Wednesday, July 3, 1996

Guam deserves a competitive dump solution

Your editorial in the June 29 PDN, titled "We need to make the incinerator plan work" contains important misstatements and fails to adequately forewarn what GEDA is buying into on behalf of Guam.

Your statement that "This plant which is required to generate 40 megawatts of power..." is grossly in error. The plant envisioned by the project has an optimistic power generation capacity of 8 megawatts.

You point out the government must pay a service fee to the contractor, but then give the impression that this will be offset through the sale of electrical power. The truth is the project promoters expect the service fee will be in the range of $80 to $110 per ton of waste processed after the sale of electricity to GPA, and Guam will still have to build and pay for a landfill for ash and non-combustible waste.

The incinerator project requires GovGuam to guarantee the promoters a minimum 22.5% profit and GovGuam must float revenue bonds of over $50 million to finance the project which will take at least 3 years to build. In the meantime Ordot is required by law to close next year.

There is a better solution, less costly and quicker to implement. A modern sanitary landfill can be built and operated at a cost of approximately $50 per ton, and be available for use within a year to eighteen months. Coupled with recycling, this provides a complete solution to Guam's solid waste problems. The promoters of the incineration project even admit a landfill can be built and operated for $70 per ton. Why pay more for an incinerator?

Major waste management companies are prepared to bid for solving Guam's solid waste problems. Open bidding is the only way the people of Guam can be assured of the best solution at the lowest possible cost. Sens. Ted Nelson and Joanne Brown have introduced Bill 561 which calls for privatization of a new landfill through open bidding.

GEDA's negotiations have been conducted without public or legislative input. A "sweetheart deal" costing more than it should, ought not become public policy without open debate and legislative oversight. Guam deserves better.

RICHARD CHERRY
Chalan Pago/Ordot

VOICE OF THE PEOPLE

The *Pacific Daily News* welcomes letters to the editor on any topic of public interest that meets standards of reasonable taste. **Sign the letter, include your full address, village of residence and a daytime telephone number, so that we may verify it.** You may include a photograph of yourself, which we may use if it reproduces well. Preference is given to letters of no more than 200 words and they may be edited for length. To give everyone a chance, we generally limit you to one published letter per month. Voice of the People is for never published letters.

For fastest publication, letters should be typed or legibly hand-written, double-spaced, and addressed to: Voice of the People, Box DN, Agana, Guam 96910, or fax your letter to 477-3079. Letters also can be sent via e-mail to voice@pdnguam.com

RP Consulate takes exception

This is in reference to an article titled "RP labor labels CNMI lower cultural category," which appeared in the June 26 issue of the *Pacific Daily News* citing negative remarks of former Rep. Tomas Concepcion on the people of the Northern Marianas and Gov. Froilan Tenorio.

The Philippine Consulate General in Guam and the Philippine Consulate in Saipan would like to take this opportunity to take exception to the statements of Representative Tomas Concepcion which appear in the June 26 issue of the *Pacific Daily News*.

The statements of former Rep. Concepcion are based on the agenda of certain Philippine labor groups and are not at all reflective of the official policy on RP-CNMI labor relations.

The resolution of our problems with the CNMI must be dealt with by concentrating on the issues and by working through the established mechanisms under an atmosphere of sincere cooperation and mutual respect.

The Philippine government notes with appreciation the sincere efforts of Gov. Froilan Tenorio in addressing the problems and concerns of Filipino workers in the CNMI.

In his recent meeting with President Fidel V. Ramos, he stressed the reforms being undertaken by his administration to actively go after violators and not merely to appease critics. He also promised to turn over a complete list of Filipino workers in the Commonwealth.

Prior to this the Philippines lifted the ban on the deployment of female workers to CNMI after a satisfactory mechanism was implemented by both parties to ensure better protection of these workers.

The labor situation in the CNMI still leaves much to be desired, but rest assured that the Philippine government will continue to expend all efforts and explore all avenues to enhance the welfare and protection of our migrant workers.

I hope the foregoing has clarified any misconceptions that may have arisen from the matter.

ANTONIO P. VILLAMOR
Consul General

PUAG presents development plans for safe water systems

■ Utility's concerns: Aquifer may tap out by 2004; funding sources need to be identified

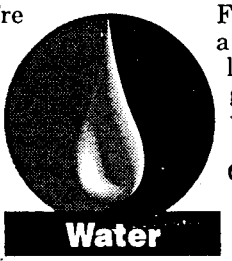
By ADRIENNE LOERZEL
Daily News Staff

Guam's aquifer may be tapped out by the year 2004, officials said, but the Public Utility Agency of Guam is working to ensure that the island will still have safe drinking water.

During a Territorial Planning Council meeting yesterday, utility officials presented plans for the development of the island's drinking water and wastewater systems.

While the aquifer is one concern, the utility's deputy chief officer Bert Johnston said the water utility faces another serious problem — funding.

"We know where we're at. We know where we want to go. We just need the resources to get there," Johnston said.



He said some aspects of the plan are already in progress, such as a management audit and a water audit.

However, before the utility can work on improving its facilities, officials will need to identify funding sources, Johnston said.

"If (rate increases) cannot be avoided, we're going to mitigate as much as possible," he said.

For example, the management audit could lead to cost-cutting suggestions for the utility's operations, he said.

Planning Council Chairman Frank Aguon, Jr. said the council will monitor the public utility's progress, and may suggest directions for the utility to follow on such issues as water rights and conservation efforts.

PACIFIC DAILY NEWS, Wednesday, July 3, 1996

Incinerator's environmental, financial impact worry Brown

■ **Problems:** Guam could face liability for pollution when it takes over after 20 years

'Incineration is not cheap. There hasn't been enough outreach information as to what it will cost the people of Guam.'

— SEN. JOANNE BROWN
R-Chalan Pago/Ordot

By DUANE M. GEORGE
Daily News Staff

Although an incinerator will mean less trash for Guam, it could also mean less cash for island residents, according to one island senator.

The government of Guam will pay about $8.5 million a year in service fees to Guam Resource Recovery Partners for running the incinerator, said Peter Melnyk, executive vice president of GMP Associates, a representative of Guam Resource.

Sen. Joanne Brown said in a phone interview from Virginia that she is worried about the financial impact on Guam's consumers and businesses.

"Incineration is not cheap," she said. "There hasn't been enough outreach information as to what it will cost the people of Guam."

Melnyk said the Department of Public Works will soon be charging island residents a fee to pick up and deliver waste to the landfill.

"An incinerator won't change those fees," he said.

He added that the cost of picking up waste from businesses will increase by about 15 percent.


BROWN

Richard Cherry, of Guahan Waste Control, said he questions whether an incinerator is necessary. He said his company has teamed with Browning & Ferris Industries, known as BFI, to bid on a landfill.

The landfill, he said, will cost about $50 a ton to operate.

Guam Resource estimates that the cost of running the incinerator will be $80 to $110 per ton, based on 255 tons of solid waste per day. That translates into $20,400 to $28,050 per day, or $7,446,000 to $10,238,250 a year.

Brown also said she is concerned about the environmental impact the incinerator will have on the island.

Melnyk said the incinerator will produce fewer particulates and less pollutant gas than any of the Cabras power plants run by the Guam Power Authority.

"We have a scrubber to remove most of the sulfur dioxide and chemical injection reduces nitrogen oxide," he said. "None of the Cabras plants has any of these treatments."

But Brown said she is concerned about when Guam takes control of the incinerator in 20 years.

"We end up with the liability for the facility," she said. "What happens if there's an environmental problem?"

PACIFIC DAILY NEWS, Wednesday, July 3, 1996

Casino firm 'gearing up' for Tinian ground-breaking

By GAYNOR DUMAT-OL
Daily News Staff

Tinian residents are beginning to see signs that the construction of a $100 million hotel and casino will start soon, the mayor's office on the island said yesterday.

Bill Nabors, chief executive officer at the mayor's office, said four bulldozers have been shipped to Tinian to clear a 29-acre site for the project.

Six engineers for the casino developer, Hong Kong Entertainment (Overseas) Investments Ltd., were on Tinian yesterday, he said.

Hong Kong Entertainment has started to rent apartments on Tinian and is also looking for warehouses, Nabors said.

"Things seem to be gearing up ... they are ready" to go ahead with the project, said Nabors.

Hong Kong Entertainment will hold a ground-breaking ceremony sometime this month, Nabors said.

The casino developer last month got environmental clearance to start building its project.

It has leased 11.3 acres of government land and rented about 18 acres of private property.

Since late last year, two other companies have announced multi-million dollar plans to build casinos on Tinian but there has been no recent announcement from either company to move forward.

Lone Star, the island's first, but small-scale casino, has not reopened since it shut down last December because of financial difficulties.

PACIFIC DAILY NEWS, Wednesday, July 3, 1996

Senator: Smaller lots make for more homes

Daily News staff

A Guam lawmaker said he wants to help lessen the cost of building a home.

One of the most expensive aspects of financing a new home is purchasing land, said Sen. Sonny Orsini, so reducing the minimum lot size for a house lot would help more people afford their own homes.

Orsini, D-Barrigada, is the sponsor of a bill that would reduce the minimum house lot size from 10,000 square feet to 3,000 square feet for areas with sewer connections.

Without sewer, 5,000-square-foot lots could be used for houses, while current law requires non-sewered house lots to be at least 20,000 square feet.

Orsini said the bill will allow more people to build homes, and could start a construction boom on island.

Despite the potential for more homes and more utility needs, he said, the water and power utilities should be able to compensate for any extra infrastructure demands with a greater customer base.

Public Works plans to ask for 2 sites for new dump

■ **July 3 deadline:** Instead of selecting one of the two proposed locations, both will be requested

By ADRIENNE LOERZEL
Daily News Staff

The Department of Public Works must choose the site for its next landfill by tomorrow, but instead of choosing, the department will ask for two sites, Public Works director Gil Shinohara said.

A law requires that the Ordot dump must be closed in April 1997. Before the dump can be closed, however, a new landfill must be in operation.

Public Works officials must choose the new landfill site by tomorrow. While officials have said that the choice had been narrowed to two southern sites, Shinohara said the department will probably ask for both.

"Right now we're discussing it between our staff," he said. "Most likely, we're going to request for both sites."

❑ See LANDFILL, Page 4

PACIFIC DAILY NEWS, Tuesday, July 2, 1996

Landfill: Additional room for expansion

❑ Continued from Page 1

One site, known as Malaa, is privately owned, while the other—Gautali—does not have convenient access, officials have said.

The cost of developing either site will be exorbitant, Shinohara said, and having both sites will ensure that the department has space to expand the landfill.

The pending approval of a waste incineration facility also will require additional land, he added.

If the requests for the land are approved, Shinohara said, "the best avenue would be to do the condemnation route."

While the site for the next landfill has not been officially named yet, Shinohara said the new landfill could still be open in time to close Ordot in April 1997.

"The hardest thing about opening the new landfill would be the obstacle of dealing with the U.S. (Environmental Protection Agency)," he said.

However, in light of the numerous environmental violations that have persisted at Ordot for years, the agency will probably work with the department to process the landfill plans quickly, Shinohara said.

Frances Damian, of the Guam Environmental Protection Agency, said the department must contend with several environmental considerations.

As well as the federal protection agency requirements, he said, Public Works must consider the wetland permitting process of the U.S. Army Corps of Engineers.

Public Works will submit its plans to the federal protection agency in August, Shinohara said, and construction could begin in January 1997.

PACIFIC DAILY NEWS, Thursday, July 4, 1996

Aquifer limits require alternative water plan

A recent projection that shows that the island's aquifer could be overtaxed by the year 2004 has to be considered a wake-up call for water planners and water users on Guam.

Mark Cramer, engineering director for Barrett Consulting Group which completed the study, told the Territorial Planning Council this week that if water consumption continues to grow at projected rates, "we'll have to switch to surface sources to supply fresh water for the island."

Although this problem has been unfolding for decades as the island has expanded, little has been done to implement plans to upgrade Guam's water system and develop alternatives to this finite underground source.

Cramer also says that this dilemma can in some measure be delayed until approximately 2004 if the island begins to undertake effective conservation measures. Other options are to build above-ground catchments and reservoirs, explore new technology for desalination or put limits on development.

But the problem is not just this looming shortage of fresh water, it's raising the money to do something about it. According to Bert Johnston, deputy chief officer for the Public Utility Agency of Guam, it will take $600 million to implement plans that were developed in 1992 to solve the problem.

There are several ways to deal with raising the money, but borrowing more money is not a realistic option. According to Sen. Tom Ada, Chairman of the Water, Utilities and Electronic Communications Committee, "GovGuam doesn't have the capacity or credit to undertake that kind of debt."

Aside from the very likely possibility of additional rate increases, PUAG must also attempt to recover lost revenues from water that isn't accurately metered and water that is lost through leaky pipes. Approximately 45 percent of the water PUAG produces — and the revenue it should generate — are lost that way. It doesn't take legislation to solve that problem.

Ada recommends an additional option — privatization. He says he's currently drafting legislation that sets the stage to attract investors to "franchise" water development projects for the island instead of relying on non-existent government funds.

Before the capability of the aquifer is depleted, these options need to be explored and the best methods implemented at once.

If not, we will be forced to live with the arid consequences.

We can host a $4 billion fishing industry

PACIFIC DAILY NEWS, Friday, July 12, 1996

JOE MURPHY
Pipe Dreams

The pieces are beginning to fall into place. With some imagination, some investment and expertise Guam could become a center of a $4 billion fishing industry. But if we sit on our hands, this industry could well pass us by.

The impetus stems from the downsizing of the Navy, which in return will release much of the Western Pacific's best harbor to civilian and hopefully commercial control.

Everybody hates to see the Navy go, but at the same time they are handing Guam a major opportunity on a silver platter. We would be fools not to take advantage of it.

Earlier this week representatives from the Navy, GovGuam and local businesses met to discuss reuse plans for the Navy's Ship Repair Facility and the Fleet and Industrial Supply Center. All of this is complicated to a degree by long-term plans the Navy might have. They certainly want some facilities here with the pressure on Okinawa, and the possible positioning of China as a potential enemy.

We do know that the SRF is a valuable asset, and it would make sense to keep it and its hundreds of well-trained technicians in place. Manuel Cruz, president of the American Federation of Government Employees said: "If we can keep this work force intact, we can be helpful not only to the SRF and FISC, but to the government of Guam as well." What could be better for Guam than to work towards setting up a major fishing industry, and utilizing the SRF to service this profitable fleet of ships?

One of the first things that I would do, if I were really interested in turning Apra Harbor into a fishing center, would be to consider hiring Peter T. Wilson, president of Global Ocean Consultants, of Hawaii. Wilson was once fisheries chief on Guam, and later served in that capacity for the Trust Territories and then Palau. He recently told more than 400 tuna industry and government officials in Manila that the Western Pacific hosts 70 percent of the world's tuna, but takes only about 1.5 percent of the almost $4 billion a year generated from fishing in the area.

Wilson produced statistics which show how a few countries and companies reap the rewards of Micronesia's only natural resource. Out of more than 100 tuna canneries only four are located in the Western Pacific, and none are in the FSM, Palau, Guam or the Marshalls. More, of the 191 licensed tuna boats operating in the area, less than a dozen are based locally.

Guam has managed, because of our location, and our harbor, and access to the airport, to earn more than $150 million by shipping tuna by air to Japan, and by outfitting long-liners and purse seiners. Guam gets about $3.5 million in taxes annually and the industry employs 250 people.

Wilson says, and has the statistics to back him up that: "There is an enormous opportunity for Pacific islands to provide service facilities in a number of ports to better take care of these vessels so they can outfit quickly and get back fishing, so they don't have to travel such long distances to offload and take on more supplies."

Wilson also advised the Maldives government in the Indian Ocean, which runs its own cannery. "They own it and run it and they get the benefit. There's no foreign guys in there taking away the profit." But I would prefer some private interests get involved in any Guam fishing venture rather than letting GovGuam do it.

Recently, the U.S. Ambassador to the FSM emphasized, during her stay, the importance of commercial fishing to the FSM's future. She also made a rather strange observation that "the work ethic in the Federated States has made it difficult for investments in the FSM to succeed." I'm sure the Ambassador didn't really mean to imply the Micronesians were lazy. It is true there are cultural differences, but what is needed is motivation, not a steady flow of handouts from the United States.

Building a fishing industry on Guam wouldn't be easy, even with all our advantages.. There are problems. One is Micronesia, where most of the fish are. They are trying to figure ways to keep this potential bonanza to themselves.

There are political problems too. For some unknown reason U.S. officials began strict enforcement of port entry restrictions on foreign fishing vessels in recent months. This has driven all Taiwanese and Korean fleets carrying crew members without visas away from Guam. This is a political battle, and must be joined in Washington.

Secondly, there are environmental problems. Recent visitors to Yap and Palau tell me how these fishing vessels, many without toilet facilities, have polluted the harbors in Koror and Yap. Guam's EPA, and other regulations would have to exercise tough restrictions on such fishing boats and their crews.

The addition of a baitfish pond system at Turtle Cove in Yona could help lure ships to the island. Baitfish are hard to find, and having them available at Apra would be very beneficial to the industry. But, the firm building the ponds has run into trouble itself, not getting the proper permits and licenses.

I'm just saying that a $4 billion industry is floating around the Western Pacific, waiting for some island, or individuals to put it all together, with baitfish, canneries, outfitting ships, ship repair facilities, handling stores, offloading, and shipping the fish by air to Japan, or China, or Korea. First, we must have the expertise, and hiring a guy like Wilson would be one place to start.

VOL. 27 NO. 155 AGANA, GUAM, JULY 5, 1996

Junk car cleanup funds 'a joke'

■ **$50,000:** 'That's not even enough to take care of the junk in one village'

By ADRIENNE LOERZEL
Daily News Staff

The Director of the Department of Public Works said the money that is set aside to pay for the removal of the island's junked cars is, "a joke."

Vehicle owners pay a $5 fee as part of their car registration to pay for cleanup efforts for old cars, said Department of Public Works Director Gil Shinohara.

According to the Department of Revenue and Taxation, 99,305 vehicles were registered in Fiscal Year 1995.

Street light money

While the registrations raised almost $500,000 for the abandoned car fund, Shinohara said 90 percent of that money is used to pay for island street lights.

The remaining $50,000 is used to try to deal with the abandoned cars around the island, he said.

"That's not even enough to take care of the junk in one village," he said. "The money is a joke."

Shinohara said a car may be declared "abandoned" if it is left unattended in a public place for 72 hours. After police or village mayors declare the vehicle to be abandoned, he said, Public Works crews pick up the junk vehicles.

100 vehicles a month

Crews may pick up between 50 and 100 junk vehicles in a month, Shinohara said, but the number varies depending on the village. About 250 old vehicles were picked up during a two-week cleanup effort in Yona, he said.

Vehicles that have outlived their usefulness can be found almost anywhere on Guam — in backyards, along the roadside, and piled in junk yards. The old cars and trucks pose a number of threats to the island's environment, according to Francis Damian, of the Guam Environmental Protection Agency.

❑ See CARS, Page 4

Cars: 'The big problem is environmental cleanup'

❑ Continued from Page 1

Lead-acid batteries, freon, and oil are usually left in the vehicles, he said, and all of the compounds can contaminate the environment.

Freon gas, for instance, contributes to the depletion of the ozone layer, he said.

With the lead-acid batteries, he said "the potential for lead contamination is there." Oil leaking out of the old cars is another problem, he added.

Environmental agency officials are working to ensure that old cars that are stored on private property are not degrading the environment, Damian said.

The agency recently ordered Lujan Junk Yard to comply with environmental regulations, and the agency will continue to inspect other junk yards around Guam, officials said.

"We're trying to do one inspection a month," Damian said.

Even when Public Works crews collect old cars, however, the problem of how to dispose of the vehicles remains.

The old vehicles are taken to a staging area off Route 15 in Mangilao, Shinohara said, but Public Works does not remove oil, freon, or batteries from the vehicles.

"We don't have the capability to do the removal," he said.

The Mangilao site already has thousands of cars that need to be cleared out, he said.

Scrap metal companies have contacted Public Works about salvaging the metal in the old vehicles, but none of the proposals have become a reality, Shinohara said.

Though the scrap metal at the Mangilao site could be sold, he added, the expense of recovering the metals makes it difficult to find people to take it.

"The big problem is environmental cleanup," he said, and companies don't want to spend the money to deal with the environmental regulations. "I'm not interested in getting any money. I just need a guarantee that ... the cars will be removed," he said.

PACIFIC DAILY NEWS, Saturday, July 6, 1996

Junk car problem will take big commitment

The money collected to clean up junk cars around the island is "a joke," according to Gil Shinohara, director of the Department of Public Works.

According to him, of the $5 fee vehicle owners pay for cleanup efforts when they register their cars, the law only specifies that 10 percent will go for that purpose — the rest is used to pay for street lights.

Last year there were nearly 100,000 vehicles registered, which means of the $500,000 collected, his department only had about $50,000 available for the effort. "That's not even enough to take care of the junk in one village. The money is a joke," he said.

He's right. This is a mere pittance to clean up the thousands of abandoned cars and rusting hulks strewn around the island. There are some answers, but they will take a big political, business and community commitment to make it work.

Shinohara says that his crews pick up between 50 and 100 abandoned vehicles a month around the island. A vehicle can be declared abandoned if it is left unattended for 72 hours in a public place.

Besides the funding problem, the these old cars pose several other concerns. According to the Guam Environmental Protection Agency, lead-acid batteries, freon and oil — all of which are pollutants — are left in the abandoned vehicles.

Even when Public Works crews tow away the vehicles they have a storage problem in their staging area.

Some of the obvious answers include increasing the registration fee to increase the fund, reapportioning the fund to put more money into the cleanup and adding surcharges to the sale of cars — new and used — to generate more money.

While these changes would definitely increase the amount available to offset Public Works' expenses, it would also increase the DPW workload and fill up limited storage at a faster rate. The best idea is to develop a partnership between the community, Public Works and the business community.

If there is enough incentive for a private business to come in, then the problem can be dealt with. For instance, provide some of the funds from increased revenues back to the villages as a reward for cleaning up their problems. Yona recently picked up about 250 vehicles in a two-week period.

Then use some of the funds to offset costs a commercial operation may have in transporting, crushing and shipping these old vehicles. This should balance both the workload, the responsibility and expense for everyone.

Couple that with a stricter enforcement of the law for dumping old cars, and we may end up turning this joke around.

Tenorio slams Interior 'and other troublemakers'

■ **Recurring anger:** 'They are not interested in our culture; they are interested in control'

By GAYNOR DUMAT-OL
Daily News Staff

SAIPAN — Gov. Froilan Tenorio issued one of his harshest criticisms of the Department of the Interior during a Liberation Day speech yesterday.

"I denounce the Department of the Interior and other troublemakers in the federal government," Tenorio said before a sparse crowd that gathered for a ceremony after the Liberation Day parade. A large crowd watched the parade but most did not stay for the ceremony.

"They talk about protecting our culture," Tenorio said. "They are not interested in our culture; they are interested in control."

Tenorio's recurring anger at Interior was stirred — this time, and in part — by the department's recent recommendation that Congress impose federal control over the commonwealth minimum wage.

The Interior Department has also said it will decide one year from now whether to push for federal intervention in the commonwealth's immigration affairs.

Guam culture 'eroded'

"We only have to look (at) Guam to see how much further their culture has eroded as a result of U.S. immigration laws," Tenorio said.

"More Chamorro is spoken in the CNMI and its form is purer here," he said.

According to Tenorio, the commonwealth has established a balance between the hiring of temporary foreign workers and the commonwealth's small size and local population.

"However, there are some in the federal government who would upset that balance and permit the entry of permanent resident aliens who eventually would become citizens," Tenorio said.

"Our local culture would soon be swallowed up in the process," he said.

Despite his complaints about the federal government, Tenorio said he is happy to have the right to complain about them.

"I am proud to be an American but you can love America and not love the federal government," he said.

"Instead of protecting our right to self-government, they take it away. Instead of using their foreign affairs power to help us, they undermine our efforts to resolve international problems."

Tenorio was referring to a recent incident in which he said an unnamed Department of the Interior official provided negative information to Philippine Sen. Gloria Macapagal-Arroyo on the issue of Filipino workers in the commonwealth.

'Best tradition' of patriots

The governor said his criticism against the Interior Department was made "in the best tradition of the American patriots," who fought for self-government.

"Let's celebrate the Fourth of July like other Americans — with pride in our country and a healthy distrust in our central government," Tenorio said.

More than a year ago, Tenorio also had a fight with Interior official Leslie Turner.

Tenorio told her to "mind (her) own business" after Turner recommended joint efforts between the Philippine and United States to look into allegations of Filipino worker abuse in the commonwealth.

PACIFIC SUNDAY NEWS, July 7, 1996

Ada: Privatize water projects

■ **Senator:** Bill would let firms lease areas like Ugum River Dam, sell water to PUAG

By DUANE M. GEORGE
Pacific Sunday News

Sen. Tom Ada has introduced a measure to help forestall what he calls an approaching water crisis.

The bill would authorize private developers to finance, construct, operate and maintain new water, waste water and surface water development projects instead of having the government and the Public Utilities Agency of Guam shoulder the task.

"I don't believe GovGuam has the borrowing capacity to address the developments," Ada said. "The needs of the community and PUAG are mounting while our capacity to finance these projects in the bond market has shrunk. GovGuam is financially strapped. The government has to look to the private sector to be the engine that will drive the underwriting of these projects."

Ada says that meeting the island's water and wastewater needs up to the year 2010 will cost $600 million: $250 million for a sewer collection and treatment system; $250 million for the transmission storage and distribution of water; $100 million to develop surface water projects.

"We do know that population will grow, our economy will grow, so we need to increase our production of water," Ada said. "Currently, comparing PUAG production of water and maximum daily demand, there's a shortfall of about 9 million gallons a day. That manifests itself as low water pressure and maybe temporary water outages."

'I don't believe GovGuam has the borrowing capacity to address the developments. ...The needs of the community and PUAG are mounting while our capacity to finance these projects in the bond market has shrunk.'

— SEN. TOM ADA
D-Mangilao

Ada said he envisions long-term leases for areas such as the Ugum River Dam. A company would build a surface water development project, recovering its investment over the term of the lease.

"We're basically going to give a business a license to sell water to PUAG," he said.

There are several plans and proposals to privatize various GovGuam agencies, including the Guam Power Authority, the Guam Telephone Authority, and the Guam Memorial Hospital. Ada says while these proposals look at replacing the government's role in existing services, his is different.

"New water wells to be added to the system will be owned and operated by private investors," he said. PUAG will continue to run the existing wells and sewer systems.

Is incineration the right way to dispose of Guam's trash?

In the near future a decision has to be made on how Guam will dispose of its trash for the next several decades. On the table are a couple of choices: Continue with traditional landfill operations or supplement landfill disposal with an incinerator.

Over the last several months the government of Guam has been looking at three alternate sites to replace the overflowing dump site at Ordot. As part of that decision, GovGuam intends to privatize the operation. Recently, another alternative that has been on the books for 14 years has resurfaced — a private operation of an incinerator that would produce electrical power as a by-product and extend the life of traditional landfills.

On the surface, the concept of an incinerator sounds appealing because of diminishing land availability and our continuing power shortages, but there are other concerns that have been raised about the environmental effects of incineration, the higher cost to the residents, a nearly 3-year delay before the unit would come on line and the fact that the terms of this 14-year-old agreement between a former governor and a private company have not been made public.

So our opinion topic for next Sunday asks:

Is incineration a realistic, environmentally safe supplement to a a landfill? Would you be willing to pay more for trash collection to gain some additional electrical power production for the island? Should the people of Guam be allowed to see the agreement before a decision is made on a an incinerator?

Send your thoughts — in about 500 words — to the *Pacific Sunday News*, Pacific News Building in Agana, or fax them to (671) 477-3079. Articles can also sent via e-mail to voice@pdnguam.com Typed opinions are preferred, but neatly written articles also will be accepted. **Call us if you are interested in discussing this week's topic with our editorial board.** For information, call 477-9711-16, extension 415.

DEADLINE FOR ARTICLES: 5 p.m., Thursday, July 11.

PACIFIC DAILY NEWS, Monday, July 8, 1996

World Court to rule on nuclear arms

Pacific states argue that use of weapons violates humanitarian laws

By FLOYD WHALEY
Daily News Staff

MANILA — The World Court is expected to rule today on a case joined by Pacific states that calls for nuclear weapons to be declared illegal, as was done with chemical and biological weapons.

The Netherlands-based court, formally called the International Court of Justice, heard a Marshallese woman testify last year that after nuclear weapons testing on her island she and other women gave birth to deformed babies.

The case was brought about by a request from the World Health Organization for the court, which is the legal arm of the United Nations, to establish the "legality of the use by a state of nuclear weapons in armed conflict."

The tribunal heard testimony from nuclear states, such as France, which said that nuclear devices are like conventional weapons when force is justified. United States officials in their testimony noted that the nuclear deterrent has kept peace in the world for 50 years.

Pacific states argued that the threat and use of nuclear weapons violates international humanitarian laws, human rights and environmental laws. In the case of the Marshalls, where 67 U.S. nuclear tests were conducted in the 1950s, people have seen the effects first hand.

In a paper prepared by the World Court project, organizers said a declaration declaring that nuclear weapons are illegal would alter the foreign and domestic policy of nuclear states.

"Their governments and military leaders would face growing domestic and international pressure to review their reliance upon nuclear weapons as instruments of national policy," the paper said.

"If the (court) decided that international law applies to threat or use of nuclear weapons but avoided considering in which circumstances they might be illegal, reliance on nuclear weapons would have taken precedence over law," the paper said.

"World public opinion would condemn this," it continued. "International alarm would increase pressure for rapid progress to a Nuclear Weapons Convention like the Chemical Weapons Convention. Paradoxically, therefore, the result might be to hasten nuclear disarmament."

The World Court last week announced it would issue an opinion on the matter today.

GUAM ENVIRONMENTAL PROTECTION AGENCY

AHENSIAN PRUTEKSION LINA 'LA GUAHAN

P.O. BOX 22439 GMF • BARRIGADA, GUAM 96921 • TEL: 472-8863 • FAX: 477-9402

NOTICE TO THE PUBLIC

The Guam Environmental Protection Agency
Proposed 1996 Amendments To
Guam's Solid Waste Management Regulations

The Guam Environmental Protection Agency wishes to notify the general public and other interested parties of the availability of the proposed 1996 amendments to Guam's Solid Waste Disposal Rules and Regulations.

Since its initial promulgation, Guam's Solid Waste Disposal Rules and Regulations have been continuously amended to reflect the changing federal requirement codified under Title 40 Code of Federal Regulations (CFR), Parts 257 and 258, and those additional provisions required by the Territory. The newly promulgated federal Subtitle D Regulations (40 CFR 258) contain a total of six location restrictions for sitting or expanding a municipal solid waste landfill. These restrictions include two areas of concern (wetlands and seismic impact zones) which greatly affect Guam. The entire island of Guam is located in a seismic impact zone as defined by the municipal solid waste landfill criteria at 40 CFR Part 258, promulgated under the Resource Conservation and Recovery Act (RCRA) 42 U.S.C. Section 6945. The site of the proposed new landfill is in an area that contains wetlands. There are no provisions in the regulations for the federal government to make exemptions to the seismic impact zone and/or the wetland restrictions.

However, the federal Regulations allow for flexibility in the requirements if the State/Territory/Tribe obtains an EPA approved Solid Waste Permit Program. Therefore, Guam needs to adopt a Solid Waste Permit Program to provide owners/operators additional flexibility. Such flexibility includes: allow siting of new and laterally expanding landfills in wetlands, providing certain conditions are met; extend deadlines for closure of existing landfills that do not comply with the unstable area, floodplain, and airport safety provisions; allow use of alternative cover material; grant temporary waivers of cover requirement; and approve landfill designs appropriate for site-specific conditions. Approval of these amendments to Guam's Solid Waste Disposal Rules and Regulations is a needed step towards obtaining an EPA authorized solid waste management program.

Copies of the proposed amendments to Guam's Solid Waste Management Regulations will be made available for public review and comment at the Guam EPA Office at the following address commencing July 8, 1996 until July 31, 1996.

Calibration Laboratory Building
15-6101 Mariner Avenue, Tiyan, Barrigada

In addition, a public hearing concerning the proposed amendments will be conducted on July 18, 1996 at the Guam EPA Office Conference Room in Building 104, N Street, Tiyan at 5:00 p.m. The public hearing will be part of the agenda during the general meeting for the GEPA Board of Directors. Interested persons wishing to comment may do so during the public hearing, or by submitting written comments by July 31, 1996 either by hand delivery to the Guam EPA Office or by mailing to:

Administrator
Guam Environmental Protection Agency
Post Office Box 22439
Guam Main Facility
Barrigada, Guam 96921

Comments should be limited to those amendments to the existing Regulations only. For further information, please contact Francis P. Damian, Betwin C. Alokoa or Hasina Wong at 475-1605-8.

/s/JOSEPH C. CRUZ
Administrator

"ALL LIVING THINGS OF THE EARTH ARE ONE"

PACIFIC DAILY NEWS, Wednesday, July 10, 1996

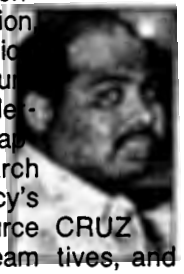
Guam EPA professionals attend conferences in their specialties

CUSTODIO

Guam Environmental Protection Agency Chief Engineer Narcisco G. Custodio, P.E., attended June 12-14 a conference on Appropriate Technologies and Issues for Water Resources Management on Tropical Islands in the Asia/Pacific Region, in Honolulu, Hawaii. The conference focused on water supply management, new construction techniques for developers, water resources and quality, and other state-of-the-art technologies as alternatives to solving water source problems. Information from this conference will enhance the Guam EPA Water Division's knowledge of water resources management on our tropical island.

SABLAN

Guam Environmental Protection Agency Planner Randy L. Sablan of the Environmental Planning and Review Division attended the Watershed '96 Technic Conference in Baltimore, Md. from Ju 8-12. Participants honed their unde standing of watershed management a proaches, techniques, and research methodologies. Sablan, the Agency's lead wetland and watershed resource planner, was a member of the technical planning team that assisted in the formulation of the Ugum Watershed Management Plan, which is currently in its Demonstration Phase. Sablan will share his new knowledge with Guam EPA staff to address the water resource planning challenges for surface water in southern Guam.



CRUZ

Guam Environmental Protection Agency Environmental Health Specialist Peter Q. Cruz of the Air Pollution Control Program attended the Radon Grant Workshop in San Francisco, Calif., June 10-14. As the only individual assigned to the Air Pollution Control's Radon Program, Cruz is responsible for developing and implementing Guam's radon program grant objectives, and overseeing Guam's Radon Contractors' Proficiency and Measurement Program. Cruz's recent training experience will help the Agency keep abreast of U.S. EPA's program requirements and goals related to radon public awareness programs, prevention and mitigation techniques.

PACIFIC DAILY NEWS, Thursday, July 18, 1996

GEPA lab set to open in August

■ **Testing:** Officials say GovGuam will save money by not sending water samples off island

By DAVID V. CRISOSTOMO
Daily News Staff

Guam Environmental Protection Agency officials said a new water testing laboratory that will soon open its doors will allow the agency to monitor water quality on island.

The new laboratory, scheduled to open in August at the agency's Tiyan office, will enable the agency to analyze water samples, said Deputy Administrator Jesus Salas.

Salas said water samples now have to be sent off-island where they are tested by a contracted laboratory.

Salas said the laboratory, which has been under construction since May, has been on the drawing board since the agency moved to Tiyan last year.

Until the laboratory is built, the agency has limited capabilities to perform water tests, Salas said.

The agency conducts water quality tests to ensure compliance with local and federal regulations, especially those of the Safe Drinking Water Act.

Salas said that testing the water on island can save the government money.

"Just to ensure compliance, alone, we can do it for roughly a quarter of the cost" of an off-island test, Salas said.

Independent lab

Salas said the laboratory will be independent of any other government agency.

"There are some folks trying to merge the two labs" said Salas referring to a planned water testing laboratory for the Public Utilities Agency of Guam. "We can't do that, it's not feasible. We have to remain distant from folks to make sure they are in compliance."

Bert Johnston, deputy chief officer of the utilities agency, said PUAG must recruit a chemist before it will consider developing its own water testing laboratory.

Earlier this year, government officials said PUAG had violated at least 15 water regulations for several years.

Johnston said the utilities agency has since made improvements to correct the violations. The utilities agency continues to send water samples off-island for testing on a quarterly basis, Johnston said.

Johnston added that the utilities agency has made several modifications to its water treatment plants and has made efforts to educate the public on water issues, through such measures as newspaper advertisements.

Johnston said that even though GEPA is a regulatory agency, he feels the two agencies should share resources.

"Personally, I don't see a conflict there," Johnston said. "Our concern in the resources. If we can just share, we'd be better off."

Although the new laboratory will open next month, it will take at least another year for lab personnel to be trained with the new facility, said GEPA spokeswoman Grace Garces.

Federal certification

Garces said that once the training is completed, the laboratory must be inspected by the U.S. Environmental Protection Agency to be completely certified.

PACIFIC DAILY NEWS, Thursday, July 11, 1996

Guam allotted environmental exceptions

■ **GEPA:** Without changes to federal regulations, the island would be unable to build a landfill

By ADRIENNE LOERZEL
Daily News Staff

The Guam Environmental Protection Agency is tailoring environmental programs to help fit the island better, officials said.

Unless the programs are changed, Guam will be unable to build another landfill, they said.

Federal environmental protection standards apply to Guam, but the rules aren't always appropriate for the island's unique situation, said agency administrator Joe Cruz. However, federal guidelines also allow for flexibility in the programs, he said, and the agency is creating some regulations just for Guam.

Changing the rules

"We still want to pattern it after the federal law," Cruz said, but some rules do not fit here.

For instance, federal law prohibits the construction of landfills in seismic zones or near wetlands, said Francis Damian, of the agency's solid waste division.

"The entire island of Guam is in a seismic impact zone," he said, but the island clearly needs a new landfill. Additionally, the sites that are under consideration for the next landfill are near or in wetland areas, Damian said.

Landfill concerns

If Guam followed the federal solid waste regulations, he said, the island would not be able to build its next landfill.

"Guam needs to adopt its own solid waste permitting program," he said. While the process is already well under way at a local level, the U.S. Environmental Protection must approve the program before it can be implemented here.

Damian said a local law, passed in December, was a crucial step in the creation of the permitting program.

The next step involves the creation of regulations that match the updated statute. A public hearing will be held on the new rules this month, and public comments will be accepted through July 31, Damian said.

"I think it's going to have a big impact on landfill operations on island," he said. The Navy, the Air Force, and the Government of Guam operate landfills here, he said, and some private companies also have an interest in solid waste management.

After officials respond to any significant comments and, if necessary, further amend the regulations, the draft will be submitted to the governor and the Legislature for approval, he said.

"We've been working on ... program approval since 1992," Damian said. If everything flows smoothly, he said, the program should be approved by the federal protection agency late this year or early in 1997.

Other divisions of the Guam Environmental Protection Agency also are working on local permitting programs.

The air pollution control division is presently drafting regulations, said Ben Machol, a special assistant to Cruz.

The 1990 Clean Air Act contains some strict regulations, as well as provisions for high fees associated with violations, Machol said.

Because Guam's program is small, and can be funded with federal grant money, he said, the high fees aren't necessary here.

The island also has some advantages that help keep air pollution problems to a minimum. Without much heavy industry, Guam does not see the same kind of air pollution that many states have, Machol said, and the strong off-shore winds here blow potential pollutants away from the island before they become a problem.

"Air pollution is a concern here, but it's not like Los Angeles," Machol said. "Ambient air quality is pretty good."

By creating a local program, the local protection agency will be able to streamline the permitting process for emissions sources like the Guam Power Authority, he said.

Currently, the authority must deal with the federal protection agency, the local EPA office, or both, Machol said.

"We're hoping to streamline all that," he said. "It would be nice if people could deal with just one contact."

However, Machol said, the local agency would like to continue to rely on technical assistance from the federal agency.

According to Cruz, the water quality program is also in the first stages of working on its own set of rules and regulations.

"Hopefully ... we'll take a look at other programs," Cruz said. "It would help us a lot more, but by the same token, we don't want to deviate too much from the U.S. standards."

PACIFIC SUNDAY NEWS, July 14, 1996

Power task force: No barge

■ 40 megawatt generator: Land unit called most economical interim solution

By DUANE M. GEORGE
Pacific Sunday News

A task force appointed by Gov. Carl Gutierrez has decided that Guam's power crisis will not be solved with a power barge.

The task force was formed to decide how best to use the emergency procurement authority that was granted to the Guam Power Authority in order to stabilize the island's power system.

Although the task force considered power barges as a solution, it decided that a land-based unit of 40 megawatts would be the most economical and feasible solution, while also contributing to the authority's permanent needs.

The task force also recommended upgrading and refurbishing existing facilities.

"The proposed new 40 megawatt generator will eventually be located for permanent use as a combined cycle plant," said Eduardo R. Ilao, chairman of the task force and vice chairman of the Guam Power Authority board. "In the interim, the plant will be used to contribute power directly to the islandwide system."

The task force wants those megawatts in the islandwide power system by 1997.

Members will also study Guam Power's Generation Expansion Plan, which calls for an additional 60 megawatts to 70 megawatts by the year 2000.

PACIFIC DAILY NEWS, Thursday, July 11, 1996

Malathion to be sent off island

By ADRIENNE LOERZEL
Daily News Staff

The individual responsible a chemical spill that forced hundreds of Dededo residents to leave their homes on April 17 has agreed to send the chemical off island, according to the Guam Environmental Protection Agency.

Joe Cruz, agency administrator, said the owner of the malathion, who has not been named, is working with a private environmental company to have the material shipped off-island.

On April 17, a container of malathion spilled as it was being taken to a Dededo farm. The fumes from the pesticide forced hundreds of area residents to leave their homes for several hours. Several people were also taken to the hospital during the incident.

"Some of the legislators wanted to go to court immediately," Cruz said, but the maximum fine associated with the spill would be $500.

While the pesticide's owner wasn't fined, Cruz said, he will pay about $1800 to ship the chemical off island.

VOL. 27 NO. 162 AGANA, GUAM, JULY 12, 1996

Hafa Adai, it's Friday

Fast-track incinerator

Acting governor was set to sign contract before attorney general's review

By DUANE M. GEORGE
and DANA WILLIAMS
Daily News Staff

A governor's office spokeswoman said yesterday that the acting governor would approve an incinerator project today, but later said the contract was still being reviewed by government attorneys.

Yesterday afternoon, governor's spokeswoman Ginger Cruz said acting Gov. Madeleine Bordallo would sign the contract this morning.

The waste-to-energy incinerator project, which has been in the planning stages for the last 14 years, would burn garbage and generate electricity for the island. It was recently approved by the Guam Economic Development Authority board of directors.

While looking for the contract yesterday, Cruz said, she discovered it was still under review at the attorney general's office. Guam law requires the attorney general to approve contracts before submitting them to the governor for his signature.

"It had been penciled in for tentative signing," Cruz said.

❑ See PROJECT, Page 4

PACIFIC DAILY NEWS, Friday, July 12, 1996

Project: 'Needed for Guam'

❑ Continued from Page 1

However, at the Guam Economic Development Authority board of directors meeting yesterday, one official seemed sure the contract would be signed.

"The current plan is to execute the contract tomorrow," said Andrew Gayle, the agency's legal counsel. Gayle said the lieutenant governor would sign the contract.

Vicky Renacia, spokeswoman for the attorney general's office, said the process of reviewing a contract usually takes two to three weeks.

The private waste disposal project, which cleared the first government hurdles in 1982, was delayed by litigation in the mid-1980s. Eventually, lawsuits were dropped, licenses were validated and the incinerator project was approved at the Guam Economic Development Authority board meeting on June 27.

Glenn Leon Guerrero, the agency's outgoing administrator, said the board members were given a copy of the incinerator contract at the meeting, but they didn't have time to read it.

"It was only available during the board meeting," Leon Guerrero said.

Gayle has refused to let anyone see the contract between the government of Guam and Guam Resource Recovery Partners, the firm that plans to build the incinerator.

"It can't be released until it's executed," Gayle said. The contract isn't a public document because it is still in the negotiating stage, Gayle said. Gayle said he made it clear to agency board members that the contract was not to be made available to the public.

"What we have been receiving is complaints that we're hiding something and that's not the case," Leon Guerrero said. "Our opinion is generally the same — it's a good project and a project needed for Guam."

Today is Leon Guerrero's last day on the job. He is leaving the agency to run for a seat in the Legislature.

Peter Melnyk, of GMP Associates, a consultant for the project, said plans call for the incinerator to eventually produce 40 megawatts of electricity for the island.

"At the end of 20 years, the plant would probably be big enough to generate 40 megawatts," Melnyk said. He said the incinerator would likely produce 8 megawatts of power during the first year of operation, but the government could require the company to produce the full 40 megawatts at any time. He said if the government exercised that option, the company would use a combustion turbine generator to produce the power.

PACIFIC SUNDAY NEWS, July14, 1996

Incineration project is a 'bad deal' for the people

By RICHARD CHERRY

The incineration project approved by GEDA's board during last week's meeting is going to cost the people of Guam between $5.5 million and $ 7.2 million extra per year, every year, for the next 20 years.

During the next two decades that totals somewhere between $110 million and $140 million that could be spent on education for our children, or to build and equip a modern hospital or rehabilitate our power and water systems.

That is the additional cost for burning our trash compared to recycling and landfilling in a modern sanitary landfill.

Using numbers from Guam Resource Recycling Partner's own presentation to GEDA, GRRP guarantees a maximum service fee of $167 per ton, or $127 per ton after selling 4 megawatts of electricity to GPA. They "hope" to further reduce the cost to $80 to $100 per ton, but provide no firm figures to support that. And this does not take into account the cost of building and operating a new landfill for their waste.

We believe a new, engineered sanitary landfill can be designed, built and operated for approximately $50 per ton, which will take care of 100 percent of Guam's solid waste. Our estimate was made with the help of a major mainland waste management company and based on costs for similar sized landfills in the States.

It is important to remember that this is not GEDA's money, it is ours. All of us will have to pay the additional cost of up to $7 million per year in higher taxes, tipping fees and increased prices.

What do we get for our extra $7 million. We get a guaranteed 4 megawatts of electricity, but it's not free. GPA has to pay 10 cents per kwh. We also reduce the required space for a landfill from about 70 acres to perhaps as little as 20 acres, but we still have to pay to build and operate a landfill.

A new, modern sanitary landfill, coupled with intensive recycling, is a better and less costly solution to Guam's solid waste problem. A new privatized landfill can be up and operating in 12 to 18 months, whereas the incineration project is estimated to take almost four years to bring on line. A privatized landfill will not require the government to issue any bonds, whereas the incineration project requires GEDA to float at least $55 million in new revenue bonds.

The GEDA incineration project is a bad deal for Guam. Just because government officials have made unfortunate decisions in the past, is no reason the people of Guam should suffer the consequences for the next 20 years.

Richard Cherry is general manager of Guahan Waste Control.

Shouldn't take guesswork

By FRANK J. WHITMAN

It seems that it should be a fairly simple matter to determine the feasibility of a power-producing incinerator. It is my impression that such incinerators are safe environmentally and a benefit for the communities which they serve. They are in service around the world.

My brother works for Ogden Projects which has built and runs a number of such facilities. In 1993 he arranged for me to tour an incinerator outside of Modesto, Calif. I was very surprised at the overall cleanliness. The trash was carried by a conveyor belt into the fully enclosed incinerator. On the side we saw a small trickle of ash coming out on another conveyor belt — the total remnants of the trash pile.

We were also shown the generator which, we were told, provides about a third of the electrical needs of the city of Modesto. In addition, the air emissions are monitored by the state of California via computer. We saw only a wisp of white smoke coming out of a chimney. Tires are not burned and metal remnants are collected for recycling.

The questions you raise need not be answered by guesswork. It seems a fairly simple matter to simply investigate the companies involved. What other facilities have they built? What is the track record?

We have two of the necessary ingredients: lack of space for garbage disposal and expensive power. It would remain to be answered as to whether or not we have a large enough power market and whether or not we generate a continuous supply of garbage large enough to fuel a generator on an ongoing basis.

All else being favorable, and given that no other long term solutions seem to be under consideration, if we are deterred by the three-year time frame, I would conjecture that we will be sitting here three years from now, debating about what to do about the landfill and power problems.

Frank J. Whitman is a resident of Yona.

Incinerator needs scrutiny

By MICHAEL D. CAREY

In a democracy, good government is practiced in full view so the people have confidence that their representatives put the people's interest foremost.

The GEDA/GRRP incinerator project has been around for 14 years. It has been sold and changed hands several times, and is now promoted by a New York limited partnership whose body of members remains a mystery. Negotiations have been conducted outside the public eye, without meaningful oversight by the Legislature.

Even after approval of the contract at its most recent board of directors meeting last week, GEDA refuses to release copies of the approved contract. In fact, members of GEDA's board were not given an opportunity to review contract documents prior to their being asked to vote.

I am not making any claim that the GEDA/GRRP incinerator agreement contains improprieties, but I believe the public deserves to know the deal is rife with potential conflicts of interest.

GEDA's present attorney Andrew Gayle represented GRRP until he was appointed GEDA's attorney in 1995. It seems unusual for an attorney who represented the private contractor to accept the position of advising a public agency on the same matter. Further, Mr. Gayle's daughter is presently employed by GMP Associates whose principals have a direct ownership interest in GRRP.

Although no copy of the contract has been released for review, GRRP's presentation to the GEDA board suggests that GRRP may have obtained exclusive rights to establish a recycling facility, an option to construct and operate a new landfill, and rights to establish a 40 megawatt power plant in addition to the eight megawatt waste-to-energy power plant. With the exception of the waste-to-energy plant, none of the above is included in GRRP's license. Has GEDA granted rights to these "add-on" projects outside established GovGuam procurement procedures?

At a minimum, this deal deserves the light of public scrutiny.

Michael D. Carey, of Agana, has been active in environmental issues on Guam

Government required to proceed

By GLEN LEON GUERRERO

To complete a process that began 14 years ago, the Guam Economic Development Authority has moved forward to provide Guam's first waste-to-energy facility. In 1982, GEDA issued the license for this facility.

Last month, the GEDA Board of Directors approved a contract with GRRP Partners that provides for the construction and operation of an incinerator which would recycle solid waste into energy for the community.

The decision to pursue an incinerator was made during the Calvo Administration, when International Energy Enterprises was given the exclusive right to build and operate such a project. IEE's contract rights were later purchased by GRRP.

In reviewing the contract GEDA verified that the government had the waste-flow to meet the volume to contractual requirements based on the expertise of the Department of Public Works, the Guam Environmental Protection Agency, and other experts. By December of 1994, GEDA executed a term sheet binding the government to deliver 90,000 tons a year at a tipping fee of $167 per ton.

A second objective was to reduce the tipping fee to $167 per ton. This represents the maximum amount GRRP would charge. However, over the last 18 months, GEDA has obtained an agreement that the fee could be reduced to $80 to $100 per ton.

GEDA and this current administration are obligated to fulfill prior obligations. At the same time, GEDA is working to ensure that the operational and financial structure of the project are in the best interest of the public.

Most importantly, our community will benefit from this facility. Through the incineration process, the raw garbage is converted into an environmentally safer product. We avoid creating another Ordot Dump, and many of the health and environment hazards of burying raw garbage.

Second, the incinerator provides a long-term solution to our island's waste disposal needs. Since it produces ash, the facility will extend the life of a new landfill.

Third, the facility will provide something we desperately need — additional power. In addition, since the fuel is garbage not oil, Guam will save money on fuel costs to produce extra power.

GEDA invites the public to all its board meetings through notices in the paper. At last month's meeting where the board ratified the incinerator contract, members of the public did express their views prior to the vote.

Having completed its job in ratifying a contract deemed by the attorney general's office to be valid and binding, GEDA has now sent this contract to the governor for his consideration.

Glenn Leon Guerrero is the former administrator for GEDA.

Need to shed light on the project

By JOANNE M. S. BROWN

During the long drawn out negotiations for a Guam waste-to-energy facility between GEDA and GRRP which has continued with little public input for more than six years, GEDA has failed to keep the island community adequately informed of the progress of this project.

This is major violation of the community's right to know, especially when the final decision will affect the pocketbook and livelihood of every resident on Guam. It is safe to assume that island residents will pay higher costs for groceries, clothing and daily living expenses that businesses will be forced to pass on because of limited options in the disposal of their solid waste.

There are a host of questions surrounding the proposed facility. The project is not supported by a substantial feasibility study, or even a preliminary environmental impact assessment.

What did the people of Guam gain in 1982 when the government sold the exclusive rights for incineration of the island's solid waste?How does the cost of this project translate to the average household, private business and our tourist industry? Have negotiations been conducted with the best interest of the community in mind?

The U.S. Environmental Protection Agency continues to push for an integrated approach to municipal solid waste management. Shouldn't the people have access to other potential solutions for our solid waste disposal that are less costly and more environmentally friendly?

Already we are burdened with the problems of the Guam Power Authority facilities and the lack of proper water infrastructure with the Public Utility Agency of Guam. Are we willing to bear the responsibility and liability for an incinerator when we inherit it in 20 years?

Last month, GEDA board members recommended the execution of the waste-to-energy agreement. This was promoted even though a concern was raised by a board member who had not had the opportunity to review the contract between GovGuam and GRRP.

The exclusive nature of the agreement for this project makes it somewhat slanted. To keep costs down, a competitive bidding process has already been established on Guam. Why is it being ignored? Did the GEDA board look at the details or simply rubber-stamp a done deal?

It is obvious that the interest of the community has not been addressed. Efforts to secure much-needed information from GEDA have been frustrating and slow. We need to shed a great deal more light on the details of this project.

Joanne M. S. Brown is a member of the 23rd Guam Legislature.

PACIFIC SUNDAY NEWS, July 14, 1996

FORUM TOPIC

Disposing of Guam's trash

A decision will soon be made on how we will dispose of trash for the next several decades. GovGuam has been looking at sites to replace the overflowing dump at Ordot. Recently, an alternative that has been in the works for 14 years resurfaced — a private incinerator.

On the surface, the concept of an incinerator sounds appealing because of land availability and our continuing power shortages, but there are other concerns that have been raised about the environmental effect, the higher cost to residents, a nearly 4-year delay before the unit would come on line and the fact that negotiations with this private company have not been made public.

Is incineration the right way to dispose of Guam's trash?

Barbara Hooker
Tamuning
Retail store owner

If qualified people built and maintained it properly I would be in favor. It would be more realistic to have a private company run it.

Rick Cruz
Dededo
Retired

An incinerator would be good. There's a limited amount of land. I would rather see it go to the people than to be a landfill.

Liz Rosario
Dededo
Small business

The environment should be our main concern. I don't want to see any more air pollution on Guam. We need to promote recycling.

Joy Coyco
Santa Rita
Branch clerk

It's O.K. as long as it doesn't affect the air. The garbage at the landfill is more of an environmental hazard now than if it was incinerated.

Jay Perez
Mangilao
Pacific Islands Club

If everything was combined such as oil, plastics and chemicals it would cause more pollution than a landfill. Recycling would be more effective.

Frank Cruz
Talofofo
Small business

As long as the incinerator is regulated it would be acceptable. I wouldn't mind a fee for pickup if it prevents further pollution.

OUR OPINION

Incineration may be right, but deal smells

Among the most important threats to the quality of life as Guam continues to expand, waste disposal — as evidenced by the overflowing Ordot Dump — is near the top of the list.

The island's failing power generation system and sewage system catch more of the headlines and produce a more immediate effect on our daily lives. But the long-term concern over the tons of solid waste we generate each day could be more of an environmental catastrophe if not resolved soon.

And among those who are fully aware of the consequences and options — environmentalists, waste disposal experts, and private concerns and government entities involved in the disposal business — the challenge is to find the best way to deal with our garbage, economically and environmentally.

The experts have found that a combination approach — waste reduction, recycling, land fills and incineration — in varying amounts will meet that criteria. The percentage of waste that should be directed toward each project depends on the unique circumstances and requirements of each location.

Enter the debate over incineration.

Each method of disposal has drawbacks and benefits. In the case of incineration, an efficient waste-to-energy conversion process will greatly reduce the amount of waste and can produce electrical energy as a by-product, and still comply with reasonable air pollution standards.

That, in concert with the other methods, could provide a valuable service for Guam. But there has been a lot of controversy over incineration systems in the states, because they can be far more expensive than traditional methods and not all projects perform within acceptable standards.

The project deserves careful public consideration, because whatever system or combination of systems we choose will be a major investment in money and have environmental consequences that we will have to live with for decades.

But much of that choice was taken away from us 14 years ago when the Calvo administration decided to sell the sole licensing of this concept to a single company. A lot of things have changed — technologically, environmentally and politically — since 1982. And if that wasn't bad enough, the negotiations and the terms of the contract which would obligate the government — and the people of Guam — have been kept secret.

According to the attorney general's office and the Guam Economic Development Agency, which has represented GovGuam in negotiating the agreement, the contract and it's specifics will not be made public until the contract is signed by the governor.

Although the provisions of the contract may turn out to be acceptable, there's no way to know that at this point.This contract must be thoroughly examined by those who have a vested interest — the people of Guam — before it is signed.

Here's yet another chance for the governor — the primary sponsor of Guam's Sunshine Law — to expose this contract to the light of day and bring this important decision to the people of Guam. This is the right way to clear up this mystery and restore their faith in the system.

PACIFIC DAILY NEWS, Tuesday, July 16, 1996

Jellyfish: Sting only when touched

❑ Continued from Page 1

fish sighting.

Smith, of the Marine Laboratory, said jellyfish drift on a circular ocean currents between the Philippines and Guam. He said Guam gets constant trade winds blowing off shore, generally keeping jellyfish away from the beaches during the dry season. During the rainy season, Smith said, wind can come from different directions.

"They are always around," Smith said of jellyfish. "It's just matter of where people are (to find jellyfish). Certainly, more people you have in the area, it is likely someone will get stung."

He said the venom in cells of Guam's jellyfish can affect the respiratory system, causing breathing problems.

Smith said jellyfish that sting people on Guam are likely a breed of Cubamedusa, or box jelly.

San Augustin said he believes the Cassiopea jellyfish is the villain at Ypao Beach. The brown-tinted creatures can be found lying on the bottom of shallow water exposing their tentacles upward.

Smith said a person has to stir up water to swim into Cassiopeas since they do not float in the water. Also, he said, Cassiopea's stinging cells are so short that people may not feel a sting on areas with thick skin, such as the palms.

Although the box jelly in Australia can kill children, Smith said, jellyfish stings around Guam are usually not fatal.

"(Jellyfish) sting people because people are in the water, bumping into them," Smith said. "They are not attacking people."

Tourists warned

Chet Neri, Pacific Star Hotel public relations manager, said the hotel puts up signs in the hotel in four languages to inform guests of jellyfish sightings at Ypao Beach.

Tomoyoshi Mori, Pacific Star Hotel front desk manager, said the closure of Ypao Beach does not usually affect the tourism industry because tourists have options of shopping or sight-seeing if beaches are closed.

When jellyfish appear at the hotel beach, Neri said staffers warn their guests of the jellyfish but they don't close the beach.

"We can't tell our guests not to swim," Neri said. "It's our responsibility to inform them. Then it is really up to them after that."

Neri said she did not receive a jellyfish alert from the Department of Parks and Recreation yesterday.

Sheila Baker-Cayetano, Hilton hotel's public relations assistant, said the hotel put up its own jellyfish alert signs in four languages on its beach yesterday after receiving the notice from park officials. Hilton staff also only advises its guests not to go into the water.

Palace Hotel staff shuttle their guests to Ypao Beach because the hotel does not have a beach near its building. Gerlie Leong, Palace Hotel assistant front office manager, said the staff tells its guests to use the beach areas behind the Tumon police koban, instead of Ypao Beach.

Jellyfish WARNING

Barry Smith of the University of Guam Marine Laboratory:

- Jellyfish that sting people on Guam are likely a breed of Cubamedusa, or box jelly. It is a transparent creature with clear tentacles coming out of an umbrella-like body.
- Free-floating jellyfish shoot out stinging cells from tentacles to paralyze or to kill fish that touch tentacles.

When stung by jellyfish:

- Rinse the affected area with sea water. Fresh water may increase swelling.
- Scrape the affected area with a sharp edged object.
- Do not rub the affected area, it will break the poison cells on your skin and cause more swelling.
- Do not apply ice because it will cause the stinger to swell.

When you are stung, you should apply:

- Rubbing alcohol
- Ammonia
- Vinegar
- Mashed papaya
- Urine

J. Quintanilla/ Daily News Staff

Source: Steve Weinman, emergency physician, Guam Mamorial Hospital

> 'We can't tell our guests not to swim.'
>
> — CHET NERI
> *Pacific Star Hotel public relations manager*

Jellyfish invasion continues at Ypao

■ Closed yesterday: UOG expert says seasonal winds blow jellyfish onto Guam shores

By HIROSHI HIYAMA
Daily News Staff

Ypao Beach may remain closed today if wind doesn't blow jellyfish away from the beach.

Park officials closed the beach again yesterday after spotting some jellyfish on the beach.

Barry D. Smith, the University of Guam Marine Laboratory Extension Agent, said jellyfish come near beaches by floating on oceanic tides or being blown by wind. Smith said jellyfish are always present around Guam and their appearance is unpredictable.

Smith said seasonal winds become especially unpredictable as Guam goes through climate changes from the dry to rainy season. Smith said currents near beaches depend on the wind.

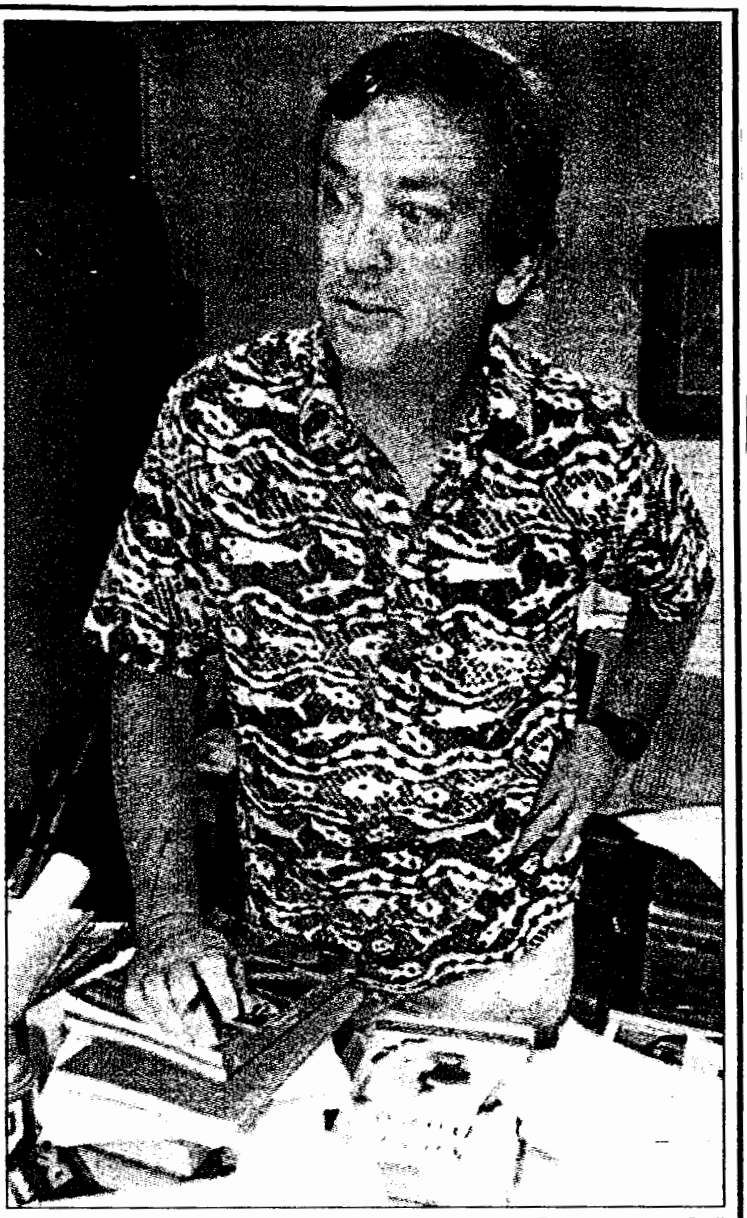
"As long as wind is blowing," Smith said, "it keeps blowing the surface water. That's what transports jellyfish to Guam."

The Department of Parks and Recreation closed Ypao Beach yesterday after receiving a report of a jellyfish sighting.

Don San Augustin, chief lifeguard of the department, said Environmental Protection Agency officials found jellyfish when they took water samples for a water-quality testing at the beach.

San Augustin said he did not receive any reports of injuries related to jellyfish stings yesterday. The department closed the beach on July 10 for jelly-

❑ See JELLYFISH, Page 4



Norman Taruc/Daily News Staff

University of Guam Marine Lab Extension Agent Barry Smith answers questions on the appearance of jellyfish in the waters of Guam at his office at UOG in Mangilao yesterday.

PACIFIC DAILY NEWS, Tuesday, July 16, 1996

Task force to develop island power solution

Last month when the Legislature gave Guam Power Authority relief from the normal procurement process and Public Utility Commission review in acquiring emergency generation capability for the island, many were afraid GPA had been given a blank check without providing any assurances.

And that concern was further elevated with the resignation of Richard Young, the authority's former general manager.

However, some of those fears may soon be alleviated if the governor's new Interim Power Supply Task Force meets its goals. The task force, which includes a mix of business, government and community representatives, has quickly developed some options that it intends to implement by Sept. 30 — the deadline on the Legislature's waiver.

According to Rick Unpingco, GPA acting general manager and vice chairman of the task force, the primary goals are to end power outages and to refurbish the island's older power generation units.

After considering the options, the task force wants to bring in a 40-megawatt, contractor-installed package that could eventually be combined with existing baseload units to provide more electricity. To save the authority from funding this $30 million project, Unpingco says a contractor would build, operate and maintain the unit and sell the power to GPA.

In addition, the task force is planning to accelerate the overhaul of Tanguisson 1 and 2, under contractor supervision and maintenance, to add 20 more megawatts to their current capacity. Unpingco says the refurbishment should take from three to six months to accomplish.

"Both programs will add another 60 megawatts to our generation capacity and we expect to them on line by mid 1997 once we get EPA permits," he said, "In the meantime Cabras 2 repairs should be complete by November, providing a full 60 megawatts by Christmas."

Unpingco sees this process as a "public-private partnership that ends up as a win-win because it shouldn't be a burden on the rate-payers of Guam."

But in the drive to make this Sept. 30 deadline it's important to keep the stockholders — the citizens of Guam— fully informed of the progress of the planning.

The last "fix" to the island's power woes — Cabras 3 and 4 — isn't producing as advertised and people are a little leery of GPA's solutions. Here's a chance to regain their trust.

Incinerator forces us to be Pacific dumping ground

The incinerator is not a solution to our island's landfill crisis. It is a get-rich scheme under the guise of environmental concern. Often, the very people who cause a problem will prosper for what appears to have been an oversight.

The island of Guam — a pristine tropical paradise. This is the image the Guam Visitors Bureau is attempting to sell. Not long ago,when Greenpeace representatives Jeanne and Kirby Rapaport visited, they told me the first thing they wanted to see was not our lovely sights but the Ordot Landfill. Considering Guam's size and population, they advised that incineration, as a solution for our garbage, should be trashed at the top of the pile.

Their conclusion: If Guam does build an incinerator we can kiss our tourism sales pitch completely goodbye, because it would necessitate Guam's becoming the dumping ground of the Pacific. After we spend up to $50 million on an incinerator, can we walk away from that kind of an investment? We'd need to solicit other islands to send their trash to us to help us get lower rates by keeping it going.

Incinerated household products may be nearly invisible but they can be frighteningly dangerous. The gases and ash from incinerators contain more than 200 toxic chemicals and harmful heavy metals. Dioxins and furans are formed that are so toxic no safe levels have ever been established. Some can cause permanent genetic defects — mutations that do not revert to "normal" down the generations.

There are claims that "pushers" for incineration broke three promises that convinced politicians to procure these megamillion dollar machines with precious tax dollars. These were: Incinerators are safe; the government will protect us and incineration promotes economic growth.

Other communities who bought the concept, spent between $8 and $50 million for incinerators in the hopes that the lazy man's way out (not recycling) would work for them. A marked increase in childhood cancer has been reported throughout communities with "waste-to-energy" technology (i.e. incinerators).

And there are communities where workers at incineration plants choose to take helicopters to work so their families can live 100 miles away from the toxic fumes.

What is not mentioned is that, like with the golf courses using insecticides over our main water aquifer, which EPA scarcely monitors because of underfunding, those in the incinerator business monitor themselves most of the time.

In Chicago employees at a large incinerator plant leaked out the truth that disconnection of air monitors was standard procedure when the darkest smoke was released at night. It just so happens to be the smoke that is most dangerous.

In El Dorado, Ark., an incinerator blew up on April 20 1989. The emergency services people and owners didn't dare enter to inspect, afraid of toxic reaction, yet they told workers to go back to work there.

VIQUI GAYER
Barrigada

VOICE OF THE PEOPLE

The *Pacific Daily News* welcomes letters to the editor on any topic of public interest that meets standards of reasonable taste. **Sign the letter, include your full address, village of residence and a daytime telephone number, so that we may verify it.** You may include a photograph of yourself, which we may use if it reproduces well. Preference is given to letters of no more than 200 words and they may be edited for length. To give everyone a chance, we generally limit you to one published letter per month. Voice of the People is for never published letters.

For fastest publication, letters should be typed or legibly hand-written, double-space, and addressed to: Voice of the People, Box DN, Agana, Guam 96932, or fax your letter to 477-3079. Letters also can be sent via e-mail to voice@pdnguam.com

Incinerated household products may be nearly invisible, but they can be frighteningly dangerous.

We may just end up like Waco

Is this Guam, did this really happen? What is happening to our small beautiful island?

There is something really wrong with our police department. All those shootings of private citizens by our police and now the raid on the Tolan home and business.

There was absolutely no justifiable cause for this type of police action. If the Tolans were in violation of any local or federal law, all the police and the federal agents had to do was walk through the door with their search warrant and conduct their search.

If in fact the Tolans were found to be in violation of any laws, all the police had to do was stop their operation and refer the matter to the attorney general for disposition.

This type of police action must not be allowed to continue, it is unnecessary, unjustified and very dangerous. It is time that our police department is brought to task or some day we may just end up with our own Waco.

TED YBARRA
Agana Heights

VOL. 27 NO. 169 AGANA, GUAM, JULY 19, 1996

Hafa Adai, it's Friday

CNMI labor legacy

'Sweatshop' worries stall Guam commonwealth bid

By JOHN OMICINSKI
Gannett News Service

WASHINGTON — Guam could become another Saipan — a haven for "sweatshops" — if Washington approves Guam's demands for more local control of immigration, U.S. officials warn.

Objecting to Guam commonwealth negotiators' proposals for more local control of immigration, Labor Department officials say Guam could repeat the "unhappy precedent" of the commonwealth arrangement for the Northern Mariana Islands, where foreign workers are paid well below U.S. minimum wages in settings repeatedly labeled as sweatshops or even slavery.

Guam negotiators' proposals would "inevitably result in creating a two-tiered work force, with a second-tier subclass of highly vulnerable and exploitable workers having few economic or legal rights and all the ensuing labor, social, political, and human rights problems associated with a disenfranchised foreign sub-class population," said John Fraser, the department's deputy administrator.

His objections were listed among federal agency comments on Guam's draft commonwealth agreement now in the midst of negotiations. A copy of the federal agencies' comments was obtained by *Gannett News Service*.

■ Concerns not new to Guam's commonwealth drive, say lawmakers. Page 4

❑ See SWEATSHOPS, Page 4

PACIFIC DAILY NEWS, Friday, July 19, 1996

Sweatshops: 'It would be a serious mistake'

❑ Continued from Page 1

Current negotiations — between the Guam Commission on Self-Determination and U.S. negotiator John Garamendi — may lead to a new governing proposal for Guam. If approved by President Clinton, it may be sent to Congress this year, though the timetable — with a presidential election campaign in full swing — now seems doubtful.

Clearly, the CNMI experience, with many foreign workers coming to fill low-paying jobs in "Made in USA" textile plants, has alarm bells ringing in Washington as Guam seeks a new legal status giving it more freedom.

"The guestworker programs of the CNMI provide a clear, next-door example of the problems associated with insufficiently regulated guestworker programs," Fraser said, citing "a majority foreign temporary worker population; sweatshops in Saipan; cases of beatings, rapes, and enslavement on Rota; U.S. citizen babies being born to women whom the CNMI had intended would have limited rights and residency."

Under Title VII of their draft commonwealth proposal, Guam negotiators are seeking authority "to adopt comprehensive immigration laws to control the entry of all aliens into Guam, including the admission, exclusion, and expulsion of aliens."

A section of the draft proposal would give Guam control over temporary workers, saying the legislation "shall provide that temporary workers be admitted into Guam to perform any labor or services in Guam where unemployed persons capable of performing and willing to perform such labor or services cannot be found."

None of these temporary workers, it provides, could be given "a change in immigration status while in Guam."

Fraser said this language appeared to put the government in the position of encouraging guestworkers, adding, "This should not be U.S. government policy."

Labor also objected to a section of the commonwealth proposals that would give the five-person commonwealth board a veto over federal standards, including those that presumably affected wage and hours laws.

"It would be a serious mistake," said the departmental comments, "to allow Guam to nullify federal labor protections that have been enacted by Congress based on demonstrated national needs. For example, under this proposal, Guam could opt out of a federal minimum wage increase or new child labor standards."

Other agencies — including the Pentagon, State Department, Justice Department and Environmental Protection Agency — also disagree with portions of the document.

The Defense Department said Guam's ability, under the proposal, to overturn federal regulations after 180 days of consideration "would inevitably lead to prolonged uncertainty and doubt as to when a particular rule or regulation would enter into force on Guam."

The Pentagon also objected to Guam's insistence on consultations between the Defense Department and Guam before increasing or decreasing U.S. military strength on the island.

The Justice Department opposed proposed language giving Guam "all rights of internal self-government," saying it "should not be interpreted as providing Guam with rights of self-government that are beyond the reach of Congress." This could lead to "future litigation."

Also, Justice objected to Guam's proposal that it be allowed to legislate a five-year residency requirement to receive welfare and other assistance.

"While there is no bright line on what comprises a valid durational requirement," said the Justice Department Office of Legal Counsel in its written objections, "five years is clearly unconstitutional on its face ... Case law," it added, "has struck down unduly restrictive residency requirements for programs funded by states and municipalities."

CALL US

Today's question:

Is Guam fertile ground for 'sweatshop' factories? Is this the kind of industry Guam wants? Let us know what you think by calling us at **475-NEWS (6397)**

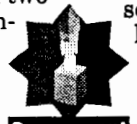
PACIFIC DAILY NEWS, Saturday, July 20, 1996

Waste disposal fees may prove costly

■ **'Tipping fee':** Billing would create a chain reaction, ending with the consumers

By DUANE M. GEORGE
Daily News Staff

Proposed waste disposal fees at the government landfill could lead to higher prices for consumer goods, officials from two private waste disposal companies said yesterday.



The disposal price, known as a "tipping fee," is paid by commercial sanitation companies to offload solid waste at the landfill.

"This tipping fee will be a direct pass-through to the consumer," said Alea Webster, general manager for Mr. Rubbishman.

"GovGuam would bill the collector — that's us; we will bill our clients; and, I assume, our clients will pass the cost on to the consumers."

"The people of Guam are going to end up paying," added Richard Cherry of Guahan Waste Control.

Free for too long

Gil Shinohara, director of the Department of Public Works, agreed that consumers always end up paying for new fees. However, he said the waste disposal service has been free for too long.

"Never has anybody paid any fees in association with the operation of the landfill," Shinohara said. "They've gotten free service from the government."

There are currently no tipping fees, but an act introduced by Public Works through the governor's office would charge residents $8 a month for collection and a $150 per ton tipping fee for commerical users.

Sen. Mark Charfauros, who will oversee the measure in the Legislature, said he will schedule a hearing on the proposal as early as next week.

> 'We're very concerned for our clients. ... This is an incredible increase for them to bear. We're also concerned for the consumers on Guam because prices will do nothing but go up.'
>
> — ALEA WEBSTER
> *General manager for Mr. Rubbishman*

Effect

Cherry explained the impact the commercial fee will have on the public. A 350-room hotel produces about 16 tons of solid waste a week, he said, or 832 tons a year.

At $150 a ton, the hotel would have to pay an additional $124,800 to their waste disposal company, which would be made up in increased room rates or restaurant prices. The same increase will be felt in every other business.

"We're very concerned for our clients," Webster said. "This is an incredible increase for them to bear. We're also concerned for the consumers on Guam because prices will do nothing but go up."

Cherry said that when the proposed fees were discussed in public hearings last year, he understood the tipping fee to be $45 per ton.

"That's the way it was interpreted by everybody," Cherry said.

Shinohara is upset with the solid waste companies, saying they offered testimony in public hearings last year that $45 per cubic yard was a good price for Guam.

"We provided them with a document with the schedule of fees," Shinohara said. "The documents stated it was $45 a cubic yard."

"At no time did I personally hear $45 per cubic yard," Webster said. The $45 per cubic yard price works out to $150 per ton.

Cherry said he testified in support of a $45 per ton tipping fee and that the first he heard anything about $45 per cubic yard was from Shinohara at a Guam Economic Development Authority board meeting on the incinerator project.

'Fairly reasonable'

"We feel the rates are fairly reasonable," Shinohara said. Public Works came up with the rates by figuring out the cost of opening a new landfill and closing the Ordot Landfill, he said.

Marshalls eyes $1B in resorts

By Giff Johnson
For the Variety

MAJURO-A Korean investment group is moving ahead on plans to invest close to $1 billion in major resort developments in the Marshall Islands, including casinos, hotels and golf courses, in Mili and Majuro atolls.

Haeng Yong Mo, president of the Development Corporation for the Republic of the Marshall Islands, said his group of investors wants to create a "Korea town" in the Marshall Islands that will attract Korean tourists by the thousand.

Local business partner Kejjo Bien said that President Amata Kabua and Mo signed agreement in Majuro for both the Mili and Majuro (Laura) projects, demonstrating the governments support for the Korean investment plan.

The Mili resort project is the larger of the two. "They plan to spend $500 million for the Mili resort," Bien said. Mili will be developed with hotels, condominiums, shops, casinos, golf course and a power plant, Bien said, adding that the Korean company plans to construct a runway on an island neighboring Mili to handle jets for direct air connections with Korea.

The Korean group plans a 1,000 room hotel/casino complex at the end of Majuro, which the developers like because of the beautiful white snd beaches. The investors have indicated they will spend up to $300 million on a Laura resort/casino, Bien said.

Mo, who is the chairman of Hanppuri Group in Korea-which operates food, livestock, industrial and publishing companies in addition to a hospital, led a group of about 20 Koreans who also visited Majuro, Arno and Mili atolls.

"Marshall Islands is very beautiful," Mo said. "Korean visitors will come here because of the beauty of the islands." He said he expects to be back next month, and that the hotels will going within the next three months. Bien confirmed this, saying that both projects should get underway in October or November of this year.

The group is also looking at other islands in addition to Majuro and Mili. "They like Arno," Bien said. "But they haven't signed an agreement yet with local leaders."

The biggest attraction for the Korean investors is the new law legalizing gambling in the Marshall Islands. "The casino law is bringing their interest in the Marshall Islands," Bien said. "There will be casinos in all the hotels."

The investors are interested in gaining landing rights for direct flights to service Majuro and Mili from Korea.

The Mili Island resort plan includes resettling the islanders currently living on the main island. Bien said that there is a lot of land on neighboring islands for resettling people. Arranging for people to move is the job of the lcoal traditional leaders, who have signed the business deal with the Korean development group, said Bien.

PACIFIC DAILY NEWS, Monday, July 22, 1996

Waste disposal costs need a critical review

In reaction to the government of Guam's latest plans to open and operate a new landfill, two private waste disposal company officials have balked at what they describe as excessively high disposal fees.

The disposal price, known as a "tipping fee," is paid by commercial sanitation companies to offload solid waste at the landfill. "This tipping fee will be a direct pass-through to the consumer," said Alea Webster, general manager of Mr. Rubbishman. "The people of Guam are going to end up paying," added Richard Cherry of Guhan Waste Control.

Gil Shinohara, director of Public Works, which manages the Ordot Landfill, agreed that the public always ends up paying for new fees. Until now, GovGuam has footed the bill for all costs associated with running the landfill.

But Public Works has entered legislation through the governor's office to institute an $8 a month residential collection fee and a $150 a month per ton tipping fee for commercial users. According to the bill, Public Works would generate nearly $11.4 million a year from these charges.

Cherry said that when the proposed fees were discussed last year in public hearings, he understood the tipping fee to be $45 per ton. But he believes this current proposal is a "ridiculously high fee, in my opinion — $50 to $55 would be fairly common and acceptable in the United States."

If it's going to take nearly triple that rate for Public Works to operate a dump, then we need to think seriously about privatizing the venture as has often been discussed.

We need to take the expense of the operation off the back of the government and the taxpayer, but this additional charge is going to come back to all of the island consumers — that amounts to about $81 a year for every person on the island — through increased costs that businesses will have to pass on.

Before this legislation goes any further, the government of Guam must open bids for private companies to compare costs.

Not only will this help validate actual operating expenses of a landfill, and hopefully save everyone some money, but it allows private enterprise a chance to flourish.

PUAG autonomy can solve our water, sewer problems

Concerns that water rates may increase now that the Public Utility Agency of Guam will become autonomous may be valid. But with the freedom to run its own show, the utility now has the ability to implement changes that might not require that to happen.

This past year water and sewage rates jumped dramatically, primarily because PUAG's political masters have resisted the requirement to do gradual increases over the years that would have kept up with the cost of production. And other revenue generation measures, such as a system development charge to new users that was passed into law in 1989, have been stalled because of the lack of political will.

But now PUAG, under the control of an appointed board, can begin to implement some measures that could avert another expensive user rate increase.

First on the list of needed changes is the installation of new meters to replace nearly 6,000 faulty ones. The utility estimates revenue loss due to bad meters is costing the rest of us. Next, PUAG needs to continue work on repairing broken water lines that experts say are leaking nearly 40 percent of all water pumped through the system each day.

Finally, the utility company needs to develop a consensus with the new board to institute the system development charge that has gone uncollected for nearly seven years. According to Joe Mesa, former PUAG chief officer, this could amount to untold millions of dollars that would have helped offset costs and helped finance upgrades to the system.

Autonomy has opened the door for solutions — now let's see if PUAG's management will make the right decisions.

PACIFIC DAILY NEWS, Tuesday, July 23, 1996

Senator: Guam must honor incinerator deal

By JOE COCHRANE
Daily News Staff

After yesterday's oversight hearing on a proposed solid-waste incinerator, island officials said one thing remains clear — the government of Guam will go through with the project.

"We have no other alternative," said Sen. Joe T. San Agustin, whose economic development committee held the hearing. "We're bound by the agreement."

The government has a contract with Guam Resource Recovery Partners to build and operate the incinerator, which officials said could be running by 2000.

"We made the agreement, and we're trying to get the most out of it," said Edward Untalan, acting administrator of the Guam Economic Development Authority. "I can't say it's the best deal, but it was the deal given to us.

"It goes back 14 years," he said. "People are asking us to account for 14 years."

The incinerator would burn solid waste and generate electricity for the islandwide power system. Ash from the incinerator would be buried, officials said.

The government would pay about $9 million a year to use the incinerator, which has been in the planning stages since 1982.

The governor's office is currently reviewing the contract with Guam Resource Recovery Partners and is expected to approve the deal.

Island residents and business leaders testified yesterday that the incinerator will cost taxpayers too much money, stifle solid-waste recycling efforts and cause environmental problems.

"Is this what the people of Guam really want?" asked Norbert Perez, president of the activist group Republic of Guahan. "I don't think the government knows what the impact of this thing will be."

Richard Cherry, general manager of Guahan Waste Control, said the government could instead build a new landfill that would last 30 years.

"This project has been going for 14 years," he said. "It will take almost four years to complete it."

But "a new landfill ... could be running in 18 months," Cherry said.

Eloise Baza, president of the Guam Chamber of Commerce, urged government officials to re-examine the incinerator deal, and pull the contract if it is bad for Guam.

The Guam Environmental Protection Agency and Department of Public Works will hold separate public hearings on the incinerator project within the next three weeks, San Agustin said.

PACIFIC SUNDAY NEWS, July 21, 1996

Pacific ties to Taiwan bring 'negative effects' on security

■ **'Dollar diplomacy':** Republic of China uses investment in small nations to gain U.N. foothold, says expert

'They (mainland China) will penalize Taiwan, not the countries that establish the relations.'

— **CAROLINA HERNANDEZ**
president of the Institute for Strategic and Development Studies, University of the Philippines

By FLOYD WHALEY
Daily News Staff

MANILA — Taiwan's use of small countries like Palau to gain United Nations membership and international recognition has a destabilizing effect on regional security, a Taiwan expert here said yesterday.

"These moves make China very angry and they will continue to try to block them," said Carolina Hernandez, president of the Institute for Strategic and Development Studies at the University of the Philippines. "This has negative effects on regional security."

Have no fear

But Hernandez said Palau should not fear China's military ire — or intimidating military exercises — if the tiny republic decides to formalize its relations with Taiwan.

"They (mainland China) will penalize Taiwan, not the countries that establish the relations," said Hernandez. "It is the Taiwanese that will be penalized, as we have seen in these latest military exercises."

Taiwan relations

About 30 countries worldwide have established diplomatic relations with the Republic of China on Taiwan. The mainland People's Republic of China considers Taiwan a renegade province and refuses to deal with countries that forge formal ties with Taipei.

Taiwan has used "dollar diplomacy" to establish diplomatic ties with small countries such as Honduras, Nicaragua, and the Solomon Islands.

The largest country which recognizes Taiwan over mainland China is South Africa.

"That is because South Africa was for years a political pariah," said Hernandez, who noted that Taiwan supported the country when its white minority ran the apartheid system of racial separation.

Palau involvement

Palau appears to be Taiwan's latest target.

Taiwan has been actively involved in Palau since the tiny republic became independent in October 1994. Palau President Nakamura has said he is waiting to make a decision on recognizing Taiwan.

"For countries that are cash-strapped this is an important decision," said Hernandez, who noted that Taiwan has one of the world's largest foreign exchange reserves. "Taiwan is prepared to invest heavily."

U.N. votes

Though Taiwan is an economic powerhouse in Asia, Beijing's influence has kept it from obtaining membership in the United Nations. That is where countries like Palau would be useful.

"Even if they are tiny states they still count," she said. "They have a vote in the U.N."

Some small countries spend more time at the United Nations entering or supporting resolutions about the recognition of Taiwan than they do about issues involving their own countries.

But becoming Taiwan's advocate comes with a price, Hernandez said. Such states can expect to be completely shunned by mainland China, which is considered one of the world's most important emerging economies.

"Each country that formalizes diplomatic relations with Taiwan cannot have relations with China," she said.

"Taiwanese scholars really gloat over these little victories. It's very important to them."

VOL. 27 NO. 174 AGANA, GUAM, JULY 24, 1996 Hafa Adai, it's Wednesday

Incinerator deal signed

Bordallo says last-minute changes protect GovGuam, public

By DUANE M. GEORGE
Daily News Staff

Despite cries of concern from senators, community members and businesses, acting Gov. Madeleine Bordallo yesterday signed the contract between the government of Guam and Guam Resource Recovery Partners to build an incinerator.

The incinerator will generate electrical power by burning garbage. It has been in the planning stages for the last 14 years.

Contract changes

There were some changes made to the contract — approved by the Guam Economic Development Authority and the attorney general's office — before it was signed at 10 a.m. yesterday.

The biggest change, according to Bordallo, is the elimination of a clause in which GovGuam guaranteed the company 255 tons of solid waste per day. The clause would have required GovGuam to make up for any shortfall by paying Guam Resource.

"We didn't want to bind the government to that," Bordallo said. "We made sure the government and the people were protected. The license was already a done deal; we just wanted to make sure the deal was good and controllable."

Several phone calls by the *Daily News* to attorney Ed Calvo, spokesman for Guam Re-

❑ See INCINERATOR, Page 4

Incinerator: 'May live to regret that thing'

❑ Continued from Page 1

source Recovery Partners, were not returned yesterday.

Senator's concerns

Sen. Mark Charfauros, who heads the Legislature's environment committee, said he isn't so sure the deal is all that good.

"I'm extremely disappointed," Charfauros said. "The information we've been getting is this is a sweetheart deal that will not benefit the people of Guam."

Richard B. Cherry, general manager of Guahan Waste Control, said he is not surprised that the incinerator contract was signed.

"This thing has been railroaded through as a done deal since the very beginning," Cherry said. "The people of Guam have been sold down the river."

Legislative approval

Bordallo said it's still not a done deal because the project must go through the Legislature for fees, bonding and other matters.

"I see a long road ahead," Bordallo said. "I hope we can see it materialize before too long. Hopefully we'll stay on target and come through on it."

Bordallo said the incinerator proposal went through GEDA and the attorney general's office before arriving at the governor's office. She said Gov. Carl Gutierrez told her that he wanted the Legislature to review it before it was signed.

"(Sen. Joe T. San Agustin) seemed to be satisfied," Bordallo said. "We looked it over many times. I think it was a reasonable time."

Paul Tobiason, of the Recycling Association of Guam, wasn't happy to hear that the contract had been signed.

"Oh geez," Tobiason said. "I'm just afraid we may live to regret that thing. I know we have to do something with our waste, but I don't think recycling and composting have been given a fair start; they haven't been given a level playing field."

Bordallo said the incinerator will be a part of ongoing efforts to recycle up to 35 percent of Guam's waste. She said the waste-to-energy project is a solution to Guam's waste disposal concerns that is easy on the environment. The island can no longer support trash dumps, she said.

"We have a serious landfill problem," Bordallo said. "If this is going to take care of it, I think we're working in the right direction."

Cherry said he doubts that a private company will be interested in building and operating a landfill on Guam now that the island plans to have an incinerator. He added that a landfill will still be necessary for incinerator ash and things that cannot be burned.

"There needs to be a landfill because if the incinerator breaks down or is down for scheduled maintenance, you need the people and equipment to handle the full waste stream at any given time," Cherry said. "By the time we get done with this, it's going to cost more than $150 a ton to get rid of trash and in my opinion, it can be done for $50 a ton."

Cost

Tobiason also said he is worried about who will bear the eventual cost.

"I think ultimately the costs will kick back to the visitor, the consumer and the resident," Tobiason said.

The reason the incinerator project floated around for more than a decade is that not everyone is comfortable with the notion, Charfauros said.

"I'm extremely concerned," the senator said. "I think the people of Guam will pay for this."

PACIFIC DAILY NEWS, Thursday, July 25, 1996

Incinerator plan draws mixed reviews

By DUANE M. GEORGE
Daily News Staff

The company that will build an incinerator to convert Guam's solid waste into electricity is looking forward to the next step in the process, which has taken 14 years.

"Right now, with the contract signed, we're looking at finalizing the financial models to prepare for financing so this project can go forward," said Ed Calvo, an attorney for Guam Resource Recovery Partners. "It's been a long road for (GRRP) and they want to move ahead with the project as soon as possible."


BURGESS

Calvo said company officials are relieved that the contract with the government of Guam to build and operate the incinerator has finally been signed. Acting Gov. Madeleine Bordallo signed it Tuesday.

"The project still has a lot of work to be done," Calvo said. "The contract was a critical step in the process."

Wallace Burgess, a 70-year-old Piti resident, thinks the incinerator will prove to be a good thing for the island, but said there seems to be confusion as to its benefits or liabilities. "It will certainly keep the waste problem down," Burgess said.

Cost questions

For Sen. Joanne Brown, the next step is finding out exactly what the contract is about and how it will affect the wallets of Guam residents.

"How much is this incinerator project going to cost us?" Brown asked. "There needs to be more review on what the impact of this project will be. A lot of questions are being raised and a lot more will be raised."


PAULINO

For 22-year-old Robert Paulino, a management trainee at First Hawaiian Bank, there are no easy answers to the island's solid waste problem, but an incinerator is an alternative and definitely a viable option for Guam.

"I think something has to be done," the Mangilao resident said. "I can't say whether (the incinerator) is good or bad, but it's something we have to consider."

Brown said the island's solid waste situation is an issue of concern, but she wants to ensure it is handled in a cost-effective, environmentally friendly manner. She said she will follow up on the incinerator project.

"When it comes to the Legislature for bonding and fee-related issues, that will allow myself to address the issue," Brown said. "There are issues we need to further examine, such as options to design, construct and operate a new landfill."

Law abiding citizen is a victim of the system

VOICE OF THE PEOPLE

The *Pacific Daily News* welcomes letters to the editor on any topic of public interest that meets standards of reasonable taste. **Sign the letter, include your full address, village of residence and a daytime telephone number, so that we may verify it.** You may include a photograph of yourself, which we may use if it reproduces well. Preference is given to letters of no more than 200 words and they may be edited for length. To give everyone a chance, we generally limit you to one published letter per month. Voice of the People is for never published letters.

For fastest publication, letters should be typed or legibly hand-written, double-space, and addressed to: Voice of the People, Box DN, Agana, Guam 96932, or fax your letter to 477-3079. Letters also can be sent via e-mail to voice@pdnguam.com

I want to relate an incident that happened to me, and could happen to anyone living on this island, unless something is done to change the way our law enforcement agencies treat law abiding citizens:

Day One: My car was falsely implicated in a rape case. Police officers came to my work place, interviewed me and impounded my car for tests without search warrants. At 2:30 a.m. a police officer came to my house to ask me to sign an authorization letter to test my car. No problem since it concerns public safety.

Day Two: I called the precinct at 2:30 p.m. to get my car. The officer on duty told me that the car was done and I should contact CIS. The officer responsible there was gone for the day and I was told to call Monday.

Day Three: No car. Newspaper article revealed that the vehicle they were looking for which is similar to mine has been found and the person responsible was arrested.

Day Four: No car

Day Five: I visited CIS and was given a release note to be submitted to the Property Division of GPD. After arriving at the Property Division, I was given another form to be submitted to the attorney general's office for their signature. After arriving at the AG's office, I was told to wait three days. I asked the officer back at CIS who will be responsible for my taxi fare, she said take it up to the AG's office. The AG's office said take it up to GPD.

Day Six: Still no car.

Day Seven: I contacted the AG's office again. They said they had not received the report yet from GPD. I called GPD records division and was told that it had been sent since Friday.

Finally, a concerned employee from the AG's office came to help. Even returned my call twice. Papers signed. I went to the property division of GPD and submitted the paper. I was told to go down to Lujan Towing company and pay a fee of $255.

After enduring seven days without a car, spending nearly $100 in taxi fare and getting shoved around by GPD and the AG's office because my car was falsely identified in a criminal case — may I repeat — falsely identified, I am being forced to pay $255 so I can get my car back. Is this fair?

It is now 5 p.m., GPD's property division is closed. I still do not have my car.

May I suggest this: Please tell these agencies to create a different system for innocent people who are subjected to this process in the name of public safety. Policies can be changed. Attending sensitivity training may also help. If I end up paying, I want my money back.

JOJO RICARTE
Tamuning

Incinerator residue problems

The issue of incinerator residue management has been neglected in recent discussions on the feasibility of incineration on Guam.

t should be stressed that the objective of incineration is one of waste processing rather than waste disposing. The disposal of solid residue in the form of ash left from incineration should be an environmental concern. Incinerator ash which escapes from the stack is known as FLY ASH, while the majority of ash left at the bottom of the incinerator is known as BOTTOM ASH.

Both types consist of heavy metal such as lead and cadmium which may pose potential dangers if the ash is improperly treated. Minimizing the exposure of ash to the environment should be the main objective of proper ash management.

Treatment may include recollecting or trapping of fly ash and the disposal of ash in a proper-lined landfill, together with a leachate control system that can collect contaminated water from leaching to the surrounding environment once the lining deteriorates.

Furthermore, incinerator ash should not be buried together with other municipal solid waste. Utilization of ash, if there is any, should be restricted to bottom ash. Safety measures should be taken to ensure no ash exposure to the environment from such utilization.

Furthermore the public should be informed about the disposal plan or utilization plan of the solid residue from incineration before any decision can be made.

The issue is an important one because it is directly related to the well-being of the environment and our community.

KING-TO YEUNG
Vice President, UOG Eco-Taotao Environmental Student Organization

PACIFIC DAILY NEWS, Friday, July 26, 1996.

Signing incinerator contract shouldn't cancel out options

With Lt. Gov. Madeleine Bordallo's signature on the contract, incineration may very well be a mandatory part of Guam's future. But that doesn't mean residents aren't entitled to cost-effective, environmentally safe waste disposal.

The contract, which resulted from an exclusive licensing agreement provided by the government of Guam in 1982, authorizes Guam Resource Recovery Partners to construct a waste-to-energy incineration plant. The company has nearly three years after arranging financing to become operational.

A major change to the contract eliminated a 255-ton-per-day guarantee, which means that other disposal options, including recycling and landfill, can be included to balance the island's waste disposal and environmental requirements.

Other problems which have drawn criticism and are yet to be solved — environmental impact and cost — must be carefully evaluated before this project gets under way.

First, we must be certain that we understand Environmental Protection Agency standards and ensure that they are followed every step of the way — from locating the plant to its eventual construction and operation.

Next, the Legislature needs to scrutinize financing and bonding arrangements, as well as the fee structure, to make sure that we can afford to go through with the plan.

In the meantime, we have to follow through on building a new landfill. We can't wait for three years. The Ordot Landfill has to be replaced in 1997.

PACIFIC DAILY NEWS, Friday, July 26, 1996

Guam attacks U.S. 'land grabs'

■ Ritidian Point:
'Frankly, this 'refuge' is ... a joke on the island,' says Bordallo

By JOHN OMICINSKI
Gannett News Service

WASHINGTON — Guam Del. Robert Underwood and Lt. Gov. Madeline Bordallo teamed up Wednesday for a tandem attack on U.S. land policies on Guam.

Rejecting the Interior Department's proposals that environmental and wildlife concerns must come first, they insisted that Guam should get first crack at any available federally controlled acreage.

The Pentagon has taken enough Guam land for defense concerns, they said, and they weren't eager to give the Interior Department more leeway to get more by citing environmental concerns.

Land Issues

Lt. Governor's support

Bordallo backed an Underwood bill that would give Guam first call on any federal acreage to prevent what she called more U.S. "land grabs" on the island like that involving Ritidian Point.

Despite the devastation being visited on wildlife by the brown tree snake, Ritidian Point has been turned into a refuge for "native birds that effectively have been driven to extinction" by the snake, she said.

"Frankly, this 'refuge' is simply for the brown tree snake and a joke on the island," said Bordallo, and an example of why Guamanians want to be first in line on any land that opens up.

> 'This (refuge) is an example of the U.S. pattern with Guam. ... That Guam's land, once taken for national defense, is then taken again for reasons that are never fully explained to, nor understood by, the people of Guam.'
>
> **— LT. GOV. MADELEINE BORDALLO**
> *commenting on the U.S. Fish and Wildlife refuge at Ritidiian Point*

"This (refuge) is an example of the U.S. pattern with Guam," she said. "That Guam's land, once taken for national defense, is then taken again for reasons that are never fully explained to, nor understood by, the people of Guam."

U.S. lands not needed for national security "must be returned to the people of Guam in as expeditious a manner as possible," Bordallo said.

Allen Stayman, director of the Insular Affairs Office, "strongly" opposed the bill during a hearing at the Native American and Insular Affairs subcommittee.

The U.S. government wants "habitat protection" agreements to come first when federal land is declared surplus. Underwood and Bordallo would have none of that.

The Guam land provision is part of a catchall territories' bill that backers are trying to hoist onto the last legislative flatcars moving out of Congress.

In this election year, members are getting anxious to leave after another five or six weeks of work. But it seems likely that some form of territories legislation will be back through the House and Senate before the final bell rings and members dash home to campaign.

MARIANAS VARIETY NEWS AND VIEWS-WEDNESDAY- JULY 3, 1996

Letter senders lament coral ruin on Rota

Dear Editor:

This is an open letter to the Legislator, Agency Manager, or Concerned Persons.

This letter is about the recent detonations that have ravaged the Coral Gardens in Rota. The damage caused to the Coral Gardens is heartbreaking. Let us put the importance of this reef in perspective. We have participated in more than 150 dives; the locations in Indonesia (Bali and Sulewesi) and Thailand. No where else but the Coral Gardens have we seen such pristine and beautiful examples of tiered, encrusting, laminar coral. These corals were home to a myriad variety of fish and marine life including yellow tangs, lionfish, turtle, baby white tips, and juvenile butterfly fish who, with their billiant colors and intricate pattems, add their own intrinsic beauty and value to these reefs. Words alone cannot evoke the visual images that properly describe the aesthetic importance of this reef.

If in fact this damage is irreparable, surely one of the most precious jewels in the crown of the CNMI has been thoughtlessly-and without due process-ravaged. It is said that A thing of beauty is a joy to behold. Such wanton destruction has turned that joy to sadness. The justification for this act wa that human life was in danger. We question the premise of this justification and feel that this purported danger was exaggerated from the beginning.

If human survival comes at a cost of wanton destruction of other species, what then is the value of human life? We also question also the means used to achieve this protection. the televised detonations of the depth charges showed a blast that we think far exceeded the blast that would have occurred had the depth charges alone been detonated. Surely ordnance management personnel have other means at their disposal to neutralize the danger allegedly posed by the depth charges. These same charges had not-in the fifty years since their creation-caused any problems to human life.

Are we humans so much more important than other forms of life that we have to destroy everything in our wake? If any good is to come from this, we must learn from the mistakes that such thoughtless destruction has caused. Surely we can as the most intelligent species act to protect our unique and valuable marine resources.

Our question is: What safeguards can we establish to prevent such loss of our heritage in the future? With the intelligence, hands-on knowledge and experience of the EMO and EOD and with the cooperation of governmental agencies and lawmakers we know that a solution can be found. We appreciate your attention to our concerns and thank you for your diligent efforts to protect our valuable marine resources.

Sincerely,

Marilyn K. Swift
Randy A. Harper

-MARIANAS VARIETY NEWS AND VIEWS-THURSDAY- JULY 4, 1996

Spawning time for corals

By Rick Alberto
Variety News Staff

IT'S that time of the year when corals put on what has been described as a spectacular festival likened to a fireworks display.

It's spawning time for corals on the southern Marianas covering Saipan, Rota, Tinian, and Guam. This usually starts five to seven days after the full moon in July. Incidentally there are two full moons this month, on the 1st and the 29th.

This means one can see the corals reproducing in action if one were to bother to go the sea on the nights of July 6, 7, and 8 and Aug. 3, 4, and 5.

Corals, as described by the Coastal Resources Management, are tiny creatures whose sizes can be as small as a pin head and as big as a fist.

Their colonies can dwarf objects as big as a bus and their reef masses make up the "largest constructed objects on our planet," according to the CRM.

When mass spawning occurs, which is only during nighttime, the local species of corals release great quantities of reproductive spawn into the coastal waters.

"They have been doing so in our surrounding waters during this lunar period, on consecutive years for the past 50 million years," the CRM says.

A CRM researcher, John Furey, witnessed a spawning occurrence last year in the University of Guam Marine Laboratory with his wife, Eloise, and coral reef reproduction researcher Dr. Robert Richmond.

"We were able to witness, under the laboratory's microscope, individual coral polyps releasing their gamete packages of egg and sperm," Furey said.

Coral reef researchers believe that these annual spawning occurrences hold the key to the future survival of existing reefs and the rehabilitation of corals previously damaged.

These spawning events happen in all parts of the world at different times of the year.

In the Marianas, these occur in July because of the temperature of the water which is warm enough in which the corals can reproduce, Furey says.

But during the spawning period, coral larvae become more sensitive to the presence of pollutants.

The three weeks after the spawning is considered a critical period when the corals find places to settle in, says Jessica Tomokane of the CRM.

Tomokane says these places must have no silt or sediment.

Because corals are most vulnerable during the spawning period, commercial operators engaged in earth-moving activities are advised to take additional protective measures to minimize erosion and runoff into coastal waters, if not suspend their operations.

Corals are important in that they provide a habitat for fishes, help protect the shorelines from destructive storm waves, and offer a colorful and beautiful sight to divers.

Friday • July 5, 1996

Lib-Day US bashing

Tenorio denounces DOI, federal gov't in July 4th speech

By Rick Alberto
Variety News Staff

IN ONE of his strongest official remarks yet, Froilan C. Tenorio denounced yesterday "troublemakers" in the federal government who he said are problem finders rather than problem solvers.

In his remarks during the Independence Day celebration before several thousand people, Tenorio said that while he was proud to be an American and can love America, it does not necessarily follow that he loves the federal government.

In an apparent reference to allegations that certain federal officials on the CNMI had been feeding information to a Philippine senator derogatory to the CNMI, the outspoken governor said, "Instead of protecting our right to self-government, they (concerned federal officials) take it away. Instead of using their foreign affairs power to help us, they undermine our efforts to resolve international problems."

Tenorio then went on to say, "In the best tradition of the American patriots, I denounce the Department of the Interior and other troublemakers in the federal government. They seem more interested in finding problems to keep their job than in solving problems to keep their word to our people."

He also blamed "some in the federal government" who "upset" the "delicate balance between economic opportunity and local self-government that is appropriate to our small size and population."

These certain unnamed federal officials, he added, also allegedly permit the entry of permanent resident aliens "who eventually would become citizens."

Froilan C. Tenorio

"Our cultural and political integrity would soon be swallowed up in the process. I thank God that we have been able to retain control of our own immigration and labor," he said.

The governor did not specify who these resident aliens are.

Tenorio vowed that he would not allow the interior department do to the Covenant what it did to native Americans (Indians): making treaties with them and "breaking nearly every one" of them.

Tenorio's long tirade against the federal government could have made certain federal officials squirm in their seats if they were in the stage together with the governor.

"They talk about protecting our culture. They are not interested in our culture; they are interested in control," Tenorio said of the federal government. "We only have to look to Guam to see how much further their culture has eroded as a result of

Continued on page 43

Lib-Day. . .

Continued from page 1

US immigration laws. More Chamorro is spoken in the CNMI and its form is purer here."

Nevertheless, he said, "I still believe in the Covenant, and I still believe that we made the right choice to become part of the United States."

He acknowledged that despite the CNMI's "problems" with the federal government, "at least we have the right to complain about them."

The CNMI has come to celebrate the Fourth of July as Liberation Day (the 50th this year), but Tenorio said yesterday was "Independence Day for us as well."

"Without the independence of the United States, there would have been no liberation," he explained.

Taken in another light, "our liberation," the governor said, "really came when we took control of our own destiny and chose to become Americans."

But, he added, "we can really be Americans without sacrificing our indigenous culture and our pride in our heritage."

"While we preserve our cultural heritage, our liberation will not be complete until we walk down that road we chose and think ourselves as Americans," he said,

"Chamorro-Americans, Carolinian-Americans, or some other ethnic Americans, but Americans all and proud of it," he added.

Yesterday's celebration was attended by more people than in previous years, Maria Pangelinan, Unity Festival Committee chair, observed.

For one thing, it didn't rain, but the heat was sweltering and people braved it just to watch the colorful almost three-hour parade.

A federal employee told the Variety that he would have loved to watch the parade on television in the comfort of his home, but his daughter, he said, egged him that they go.

Facing federal onslaught

HE FACES the most unenviable task and could be considered one of the most misunderstood official around. But it seems Gov. Tenorio doesn't mind the barbs which has become a constant part of his government.

True, there may have been instances where he made decisions that in some people's view are far from being right. And for those, he had to face harsh public opinion.

But one can not discount the fact that Gov. Tenorio has been no less than a leader, one who will stop at nothing just to get what he wants regardless of how much it costs. For the sake of his people.

Let's face it, one of the more positive traits attributed to Gov. Tenorio's style of governing is his being decisive, even to the point of being reckless and brutally frank.

He says things straight, the way he sees it. He doesn't mind being criticized as long as he thinks he is right. He would go through great lengths stressing his argument, with little disregard for what is politically correct and who gets ran over by his harsh words.

Though many of his critics are not particularly happy with his style, there are those who say that is how a leader should be—resolute, steadfast, and unfazed by the odds.

A case in point is his current tiff with the federal government over the issue of labor and immigration.

Fuming mad after finding out how the Interior Department allegedly seemed to be fueling the fire between the CNMI and the Philippine Sen. Gloria Macapagal-Arroyo, Tenorio has come out blasting his way through the federal bureaucracy, saying he will bring the matter up with President Clinton himself.

After all, being the highest official of the land, it is his unstated duty to defend the people of the CNMI everytime he sees that we're on the receiving end of unfair treatment from the federal government.

His analogy of the photo release to that of the Mexican beating in California states a good point as to how the CNMI may have been harshly and unjustly maligned over the labor abuse issue all this time. Just when will everybody recognize the fact that such incidence of worker exploitation does occur all over the US and could not be stopped completely?

Yes, there have been numerous instances here where foreign workers have been abused and exploited. But has anybody stopped to think that such occurrences are also happening in the mainland and other countries that are more sophisticated in their systems of government?

With the federal government becoming more and more aggressive in castigating the CNMI for its faults, it is imperative for Tenorio to stand up and start fighting, lest the smear drive will continue unabated.

Which is just what he did when he blurted out a nasty speech during yesterday's celebration of Liberation Day.

Being part of the big American family, and the youngest member at that, there should have been a bit more compassion from the paternal powers that be.

Although the scolding may be warranted, there should at least be a recognition that when foreign countries are involved, family should stick and defend each other.

But the thing is, as Tenorio aptly pointed out in his 4th of July speech, instead of protecting the CNMI's right to self-government, certain "trouble-makers" in the federal government "seem to want to take it away.

Instead of using the federal government's much-touted foreign affairs power to help the CNMI, "they undermine efforts to resolve international problems," and "seem more interested in finding problems to keep their jobs than in solving problems to keep their word to our people."

Come to think of it, is reneging on one's word and commitment the sole domain of the CNMI? Couldn't that be also said of the federal government in its continued failure to implement the letter of the law pertaining to the reporting requirement involving Compact impact?

Isn't the ongoing trend of reducing federal assistance under the Covenant also an affront to earlier commitments?

Of course, there's a big difference between the US and the CNMI in that we may be seeing the usual makings of a "master-subject relationship," where the more powerful is always right.

We hope we are wrong in this observation.

Though there may be a lot of times where we hastily choose to "dislike" Tenorio and some of his moves, his current tiff with the US is certainly not one of them.

We must all be behind the governor in this, if the CNMI and its people are to be regarded squarely and fairly.

Let's face the argument undaunted and resolute. After all, Gov. Tenorio's defense of the delicate balance between economic opportunity and local self-government would be to the benefit of all in our community.

-MARIANAS VARIETY NEWS AND VIEWS-FRIDAY-JULY 5 , 1996

DEQ water report

THE DIVISION of Environmental Quality (DEQ) analyzed water samples collected from Saipan's recreational beaches and storm water drainages this week.

None of the samples collected contained excessive concentration of fecal coliform bacteria, which exceeded the CNMI Marine Water Quality Standards.

The Division of Environmental Quality analyzes samples of marine recreational and storm drainage water from 18 locations on the west side of Saipan each week. DEQ welcomes all inquires as to the quality if beach water. The public is encouraged to contact DEQ at 234-6114 with any questions concerning this matter.

MARIANAS VARIETY NEWS AND VIEWS-TUESDAY- JULY 9, 1996

4 companies vie for contract to draft updated lagoon plan

By Rick Alberto
Variety News Staff

THE Coastal Resources Management said yesterday that four firms have submitted their bids to develop an updated use management plan for the Saipan Lagoon.

CRM Director Manuel C. Sablan identified them as the Gecko Consulting Services, Northern Islands Co., Dueñas and Associates, Inc., and Earth Tech.

Dueñas and Associates incidentally did the initial Saipan Lagoon Use Management Plan 10 years ago.

Sablan said that the updated plan should incorporate ideas on future uses including economically driven activities especially in regards to tourism.

It should also address watercraft user conflicts.

The winning bidder will be announced on Friday, Sablan said.

When the CRM announced the opening of the bid, it identified a set of preliminary work tasks for the prospective consultants.

These tasks included conducting a needs assessment for the plan's revision, surveying shoreline uses and evaluating their impacts to the lagoon resources, and resurveying the lagoon fishery and sea cucumber resources and evaluating and documenting the causes and significance of any changes to them.

The winning bidder should have:

•Experience in developing Geographic Information System (GIS) maps and data bases, in planning tropical lagoon fisheries, and developing land use and coastal resources management regulations;

•An understanding of Saipan development and watercraft use trends;

•Skills in information collation, community interaction, facilitation, consensus building, and special area management plan writing; and

•Ability to carry out project tasks within the CRM's budget.

The project should be finished before January next year, as per timetable of the CRM.

PALAU NATIONALIST PARTY

$1 MILLION WASTED ON THE BABELDAOB ROAD

The President claims the credit for the completion of the Babeldaob Road from Koror to Ngerchelong. Let us have a reality check. In the President's election '92 platform, he promised the people of Palau that he was going to complete the road construction to Ngerchelong in one year's time. For the record, it took this Administration 3 1/2 years just to connect Melkeok to Ngerdmau and Ngaraard to Ngerchelong. We suspect that this Administration illegally used money (about $1 million) from Housing Authority to finance this project. Why is a dirt road worth more instead of descent housing for our people?

What about the condition of this road? If it rains, even lightly, you will not be able to use the road with a 4 wheel vehicle, because it will become steep, and therefore, dangerous. Let us remember that according to the Compact of Free Association, the United States was responsible to construct the 53 mile road across the Big Island for $149 million of U.S. tax payers money. And, according to the U.S. Army Corps of engineers, the Compact Road is going to ONLY use 45% of the existing road (most of which was not built by this Administration) for safety and environmental purposes. This Administration should be sued for damage to the environment. So why did the President take the initiative to build the road himself? It is o.k. to perform honorable duties, as a leader of a country, but it is a crime to manipulate your own people, just to win re-election using public funds ($1 million), and at the cost of destroying our environment. These days when it rains, the drainage flow to the shores, and onto the reefs killing the corals, which attracts tourists from all over the world, who come to visit our pristine oceanic world.

As Palauans, it is not nice to say negative things about other people, but this Administration leaves us, the people, no other choice. Sometimes the truth is not so pretty. The Johnson/Keone ticket of the Palau Nationalist Party wants the people of Palau to see the actual reality of what this Administration is doing to the people of this country. To put everything in perspective, our future is being marginalized and mortgaged to pay for incompetence and decay, stemming from the old TT mentality. This Administration is a dinosaur, a relic of the Trust Territory days. Palau needs a team of young vibrant and honest leaders, together with the guidance of Palauan chiefs and elders, to bring Palau into the next century. Isn't this good for Palau? Isn't this good for you and I, and the future generations? So what is holding you up? Let us DO SOMETHING about it!

DEQ water report

THE DIVISION of Environmental Quality (DEQ) analyzed water samples collected from Saipan's recreational beaches and storm water drainages this week. None of the samples collected contained excessive concentration of fecal coliform bacteria, which exceeded the CNMI Marine Water Quality Standards.

*Micro Beach

*Beach At Dai-Ichi Hotel

*Beach At Hyatt Regency Hotel

High concentrations of Fecal Coliforms may be the result of stormwater runoff due to rain storms. Fecal Coliform bacteria are not usually disease causing. The bacteria can indicate the presence of human and animal waste in the water.

Studies have shown that storm water runoff in tropical environments may also contain fecal coliform bacteria from the natural environment. To adequately address the public health concerns, DEQ maintains its policy of advising the public not to fish or swim within 300 feet of this location within 48 hours of this notice.

The Division of Environmental Quality analyzes samples of marine recreational and storm drainage water from 37 locations on the west side of Saipan each week. DEQ welcomes all inquires as to the quality if beach water. The public is encouraged to contact DEQ at 234-6114 with any questions concerning this matter.

DEQ marine water report

THE DIVISION of Environmental Quality (DEQ) analyzed water samples collected from Saipan's recreational beaches and storm drainages this week. The samples collected from the following locations contained excessive concentration of fecal coliform bacteria, which exceeded the CNMI Marine Water Quality Standards.

*DPW Channel Bridge
*Smiling Cove Marina
*Sugar Dock

High concentrations of Fecal Coliform may be the result of stormwater runoff due to rain storms. Fecal Coliform bacteria are not usually disease causing. The bacteria can indicate the presence of human and animal waste in the water.

The Division of Environmental Quality analyzed samples of marine recreational and storm drainage water from 18 locations on the west side of Saipan island this week. DEQ welcomes all inquires as to the quality of the beach water. The public is encouraged to contact DEQ at 234-6114 with any questions concerning this matter.

Salvage job for galleon gives way to Rota coral spawning

By Rafael H. Arroyo
Variety News Staff

THE CORAL spawning season has slowed down salvage and recovery operations for the 16th century Spanish galleon, Santa Margarita, which was discovered sunken beneath the waters of Rota.

This was according to IOTA Partners Chief Executive officer Jack Harbeston who said excavation work for the 17th century galleon will have to take the back seat to the yearly coral reproduction season so as not to disturb marine life in the area.

"It's slow progress but we will have started again probably by the end of this week," said Harbeston.

"We were stood down, we did no excavation for the period July 7th to 17th and we will stop again on the excavation from August 4th to August 8, for another coral spawning period. After that, we'll start up again and continue until we finish or until a typhoon stops us," said the IOTA executive.

IOTA Partners, a Washington-based professional firm specializing in underwater salvaging, entered into an exclusive contract with the CNMI government to search for several Manila galleons believed to have been shipwrecked in the Marianas between 1575 and 1815.

In June of last year, IOTA's efforts paid off with the discovery of the Santa Margarita.

The salvage firm was able to recover small pieces of the galleon's load, enough to confirm there could be priceless artifacts in the ship's wreckage.

Based on historic accounts, the Santa Margarita is believed to have sunk off Rota in a July 1600 voyage from Manila to Acapulco.

It was believed to have been dangerously overloaded with gold, spices, porcelain, textiles and other Asian manufactured items in that last voyage.

Lately, IOTA has cordoned off the waters near the galleon site warning recreational divers that the area is off-limits to ensure the integrity of artifacts.

Meanwhile, IOTA had to stop work periodically to give way to the coral spawning season as any underwater excavation activity may cause siltation and disturb coral reproduction.

Right now, according to Harbeston, they have about 20 workers on Rota upbeat and waiting to get started again with the diving and salvaging operations.

Nevertheless, Harbeston is optimistic that the salvaging expedition will be a complete success.

"Everything we're finding says we're right in the middle of the shipwreck. We need to excavate down to a ten feet depth before we find most of the artifacts," said Harbeston.

"We're recovering artifacts right along, but nothing on the surface. You can swim over one side and you'd never even know there was a ship wreck or anything in there. But we're able to see into the dirt with electronic instruments so we know how far down we have to dig to get to what it is we're after," said the IOTA official.

He expects excavation work to continue all through the summer and hope to finish by November of this year.

Under IOTA arrangement, the CNMI government is to get 25 percent and first choice of artifacts. After a hundred percent of the artifacts is recovered, an inventory will be done after which they will be preserved through a chemical treatment process.

"We will lay them up if they can be taken out of the water. After being in salt water for 400 years, they will need special treatment. We then will appraise them and put a price tag on each item and the CNMI will go through the entire lot and take its choice of whatever it wants for public display," said Harbeston.

Those that are left over, particularly duplicative items as coins and porcelain, are to be put up for sale at an auction by one of the two chief auction houses in the world, either Sotheby's or Christy's.

According to Harbeston, both IOTA and the CNMI will make the decision together as to which one to keep and what will be sold at the auction and when.

"We're hoping to complete the diving portion of the project by November before the tradewinds start, because this is on a windward reef and we really can't work safely during the tradewinds season.

"All of the material we recover during that diving stage will be treated in Songsong and shipped to a safe place in a vault. The treatment may take a year or two, so we'll be staying on Rota in Songsong for at least through 1997 treating the iron, the wood and porcelain and so on," he said.

THURSDAY, JULY 25, 1996 -MARIANAS VARIETY NEWS AND VIEWS-

Bordallo okays deal for Guam incinerator

By Mary Rose Tiguio
For the Variety

GUAM-After fourteen years of waiting, the Guam Resource Recovery Partners can finally bring in a solid waste incinerator on Guam. Acting Governor Madeleine Z. Bordallo signed the deal Tuesday after reviewing the contract.

An oversight hearing was set where island residents and business leaders came out to testify on the impact the incinerator will have on Guam economically and environmentally.

Others who testified said the incinerator project will cost taxpayers too much and will choke the island's existing recycling efforts.

But according to Ginger Cruz, spokeswoman for Gov. Carl T.C. Gutierrez the incinerator project is actually a positive approach to Guam's waste control efforts.

"It's very positive in that it reduces the waste and it is more environmentally friendly," she said.

Cruz added that the project is also beneficial since it extends land space and adds up approximately 8-40 megawatts of power.

"If we can turn garbage into power this is actually a positive way," she said.

Grace Garces, spokeswoman for the Guam Environmental Protec-

Continued on page 19

Bordallo . . .

Continued from page 1

tion Agency said that the proposed incinerator is just one part of solving the waste problem on Guam.

She said the GEPA supports three other solutions which are recycling, reducing, and reusing. She also said that GEPA has not seen the proposal yet and cannot comment at the moment on how the emissions can affect Guam.

Some lawmakers though are dismayed by the speedy review and action that the acting governor took.

"This whole project stinks," said Sen. Mark Charfauros. "I am shocked at the speed of this project's launching."

Charfauros also said that he was upset that the deal was signed through "secret meetings" between the governor's office and officials of the proposed incinerator project.

"For the amount of $9 million, we could invest on a base load generator for our power plants.

Charfauros said that although the incinerator will produce eight to forty megawatts of power, it might require more to get the incinerator working.

He also said that he is afraid that the government will fall short of the 255 tons a day required quota. The solid waste incinerator requires that much volume of combustible materials to operate.

DEQ water report

THE Division of Environmental Quality (DEQ) analyzed water samples collected from Saipan's recreational beaches and storm water drainages this week. None of the samples collected contained excessive concentration of fecal coliform bacteria, which exceeded the CNMI Marine Water Quality Standards.

The Division of Environmental Quality analyzes samples of marine recreational and storm drainage water from 18 locations on the west side of Saipan each week. DEQ welcomes all inquires as to the quality of beach water. The public is encouraged to contact DEQ at 234-6114 with any questions concerning this matter.

From The Office Of The Vice-President

Trilateral Discussions Focus On Palau International Coral Reef Research Center

Vice President Tommy E. Remengesau. Jr., as Chairman of the Palau Technical Working Group on the Coral Reef Research Center, headed a delegation which met with leaders from the government of Japan and the Government of the United States from June 6-9 ,1996, in Koror. The Coral Reef Research Center Project arose through the International Coral Reef initiative within the framework of the Japan - U.S. Common Agenda. By the close of discussions, there was a clear understanding that the Government of Japan would consider providing funds for the actual construction and equipping of the Center, expected to be in the millions of dollars, while the government of the United States will explore possibilities for providing training, technical assistance and other cooperation in support of the center. Palau would assume responsibility for the operations and maintenance aspect.

Strong support for the project in Palau has been voiced by the President, the OEK and Koror State, In this regard, a Memorandum of Understanding was executed by Vice president Tommy E. Remengesau, Jr., President of the Senate Peter L. Sugiyama, and by Acting Speaker of the House Elia Tulop. The MOU reiterates the Center's broad research and educational mission and pledges the authorization and appropriation of sufficient local revenues, in conjunction with revenues identified from other sources, to fund the initial annual operational costs of the Center. The MOU was signed during ceremonies held on June 7, 1996 , at Leilani's Restaurant. The occasion also included the signing of a "Record of Discussion" by representatives of the three governments spelling or the clear intent to make the Coral Reef Research Center a reality as expressed by each party during the course of consultations.

Participants in the consultation agreed that the center will have a research function that looks not only to preserve coral reefs, but also to reduce the damage to the environment, including fragile coral reef ecosystems, during the process of Palau's economic development. The Center, thereby, will aim to achieve the "sustainable development" of Palau. In addition, their vision for the center is that it will provide environmental education, understanding, and information for ecotourism so that the people of Palau and tourists from abroad will better understand the importance of preserving marine ecosystems, including coral reefs. The site being proposed for the Center is the current Public Works Garage facility at M- Dock. Some concern was expressed regarding the proximity of this site to the Koror waste landfill. These concerns were alleviated when Vice President Remengesau stated Palau's commitment to relocate the dump, reclaim the land and convert the landfill area into a park or other public use area compatible with the purposes of the Coral Reef Research Center.

The management structure of the center was discussed. The Government of Palau proposed that the Center be managed as a government-owned public corporation with an independent Board of Directors. Because Japan's assistance is to the government of Palau, Japan indicated that there should be an understanding that the Board would function under or represent the policies of the National Government of Palau.

Prior to the close of discussions, Vice President Remengesau indicated Palau's interest in establishing a national protected area or ' marine preserve" in conjunction with the development of the Center. He suggested that a suitable site might be designated near Kayangel's Atoll. Such an area would provide for pristine working conditions for Center researchers and contribute to the conservation of Palau's marine resources. During closing remarks at the signatory ceremonies, Deputy Director-General Norio Hattori from the Japan Ministry of Foreign Affairs, Charge d' Affaires Richard Watkins representing the United States Government, President of the Senate Peter Sugiyama, Vice Speaker Elia Tulop and Vice President Tommy E. Remengesau, Jr., all reaffirmed the commitment of their respective governments to making the Coral Reef Research Center a reality and to the continued friendly and cooperative relationship established among the three nations.

The PALAU GAZETTE

Published by the Executive Branch, Government of the Republic of Palau

JUNE 28, 1996

Palau Environmental Quality Protection Board

Update !

EQPB? What's That?

Fifteen years ago, in 1981, our leaders and legislators had the foresight to recognize that the Republic of Palau would need a semi-independent body to assume responsibility for protecting the quality of our fragile environment. With that in mind the Environmental Quality Protection Board (EQPB) was established through the Environmental Quality Protection Act. The Environmental Quality Protection Board is composed of seven (7) members appointed by the President of the Republic of Palau with the advice and consent of the Senate, Olbiil Era Kelulau. Its objective is to protect and preserve the unique, pristine and fragile environment of our homeland that our forefathers and mothers left for us to maintain and protect for our future, the children of Palau.

The Board appoints an Executive Officer to administer the EQPB Office and, with the assistance of his staff, to promulgate and enforce its regulations. Aside from the Executive Officer, this office currently consists of 21 staff members, including a Legal Counsel, Civil and Environmental Engineer, and a Biologist with expertise in bacteriological testing for drinking water. Together, the EQPB staff works to address Palau's environmental quality issues such as solid waste, hazardous chemicals and substances, oil pollution, water pollution, and earth-moving. It is important to remember that EQPB does not have the authority to regulate Palau's wild-life species, such as turtle and dugong. These areas are dealt with by the Bureau of Natural Resources and Development.

The EQPB staff is committed to doing its part in maintaining the incredibly beautiful environment which we Palauans are so rightly proud of. We can only accomplish this goal with the support and participation of you, the members of the public. All Board meetings are open to the public, as required by law. EQPB invites and welcomes anyone who is interested to sit in on these meetings, as well as to call or come by the office, with any questions, suggestions, or concerns regarding the protection of the quality of our environment.

ROUTING AND TRANSMITTAL SLIP

Date: 2/4/97

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Allan		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Did I forward a copy of this to you? Pls. look over. The comments of significance which I thought we should forward on to Steve Costa are: #3(?) 4(?) #5- #6? Or do you think the comments ~~don't~~ are not necessary to →

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Pat CMD-5	Phone No. x1594

5041-102
☆ U.S.G.P.O.: 1993 300-891/80018

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

forward to Steve?

Thanks.

Copy to Allen Ota

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

October 23, 1996

SUBJECT: Joint Cannery Ocean Dumping Studies in American Samoa; Bioassay Testing of Effluent: February 1996 and March 1996 Sampling (QA Program Document Control Number OPIN023O96VSF1)

FROM: Eugenia McNaughton, Ph.D., Environmental Scientist
Quality Assurance Program (P-3-2)

THROUGH: Vance S. Fong, P.E., Chief
Quality Assurance Program (P-3-2)

TO: Pat Young, American Samoa Program Manager
Office of Pacific Island Programs (E-4)

The subject study plan and technical memoranda, prepared by Steve Costa/CH2M Hill/SFO and Karen A. Glatzel/Glatzel & Associates and dated July 1996 and August 9, 1996, respectively, were reviewed. The review was based on the guidance provided in "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations," May 1994 (QA/R-5) and "Guidance for the Data Quality Objectives Process," September 1994 (QA/G-4).

Major Concerns

1. [Section 1. Introduction: Purpose] It is stated in this section that both DAF sludge and high strength process waste stream material were tested for toxicity using bioassays. It is the reviewer's understanding that the programs requires that only the high strength wastes be tested, and that predictions are made about the dispersion of the plume created by dumping of the sludge using a model. Are sludge and high strength waste synonymous? The elements of the program should be stated more clearly, and the program itself described more completely so as to resolve this apparent discrepancy.

• 2A. [Section 1. Introduction: Background] It is mentioned in this section that the high strength process waste stream material and DAF sludge are positively or neutrally buoyant, but this information does not appear to be carried forward

into the modelling discussion. How this information is factored into the modeling process should be discussed further.

2B. It is also stated that observations are being made of the biological community in the dump site area. No programmatic information is provided regarding the quality of the biological data, nor is there any discussion of how the data are integrated into the monitoring program. An expanded discussion of the study of the biological community should be provided, in which the study data requirements, such as the frequency of sampling; the format for field notes; whether photographs are taken and noted; who is responsible for data collection and reporting; and how the data relate to the decisions made regarding the modeling of disposal operations, are elucidated.

3. [Section 2. Bioassay Testing: Testing Methodology, Third Set of Bioassay Tests] It is stated that the *Mytilus edulis* larval development test could not be run as the mussels were spawning. As the test requires that the adults be in spawning condition to provide gametes for the test, the statement should be corrected to state that the mussels were *not* spawning, and could not be used for testing.

• 4. [Section 4. Conclusions and Recommendations, Conclusions; Appendix 1: Special Condition 3.3.5 of Ocean Dumping Permits, 3.3.5.2 Materials and Methods, 3.3.5.4 Final Results, Analysis of Data and Discussion; Appendix 2: Study Plan (Draft and Incorporated EPA Comments), Part I: Data Analysis and Reporting] The concept of Limiting Permissible Concentration (LPC) is implied or referenced in these sections, but there is no full discussion of the LPC and how it is calculated. The level of dilution that must be achieved by the dumping operation within the dilution zone is dependent upon the calculated LPC. In light of this, a discussion of how the data used in the equation are derived and by what measures the quality of that data is determined should be included in the report.

• 5. [Appendix 2: Study Plan (Draft and Incorporated EPA Comments), Part I, Plan of Study for Bioassay Toxicity Tests, Test Methods, Sample Preparation] It is stated in the Study Plan that test water will be brought up to test salinity using anhydrous sea salts. The bioassay procedures described in the Technical Memoranda state that brine prepared from natural sea water was used to bring the samples to the correct salinity. This discrepancy should be addressed either changing the information in the body of the report or by placing an amendment to the appendix.

6. [Appendix 2: Study Plan (Draft and Incorporated EPA Comments), Part II, Plan of Study for Modeling Re-evaluation, Quality Control and Quality Assurance] It is stated that the final element of validation of a model is a determination of its sensitivity to changes in input parameters. While it is agreed that a model that exhibits "extreme sensitivity" is not desirable, an insensitive model may be equally unacceptable. It would be helpful if a discussion of the acceptable range of model response was included in this section.

Other Concerns

1. [Section 1. Introduction: Purpose] Reference is made to "DAF sludge" in this section. The acronym should be spelled out fully as it is mentioned here for the first time.

2. [Section 4. Conclusions and Recommendations, Conclusions] Reference is made to the results of the bioassays on Table 3.1. In fact, the bioassay results are found on Table 2.1. This discrepancy should be corrected.

Questions or comments regarding this memorandum should be referred to Eugenia McNaughton at (415) 744-1636.

ROUTING AND TRANSMITTAL SLIP

Date: 2/15/97

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Allan Crim WTR-2		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Allan - FYI. I agree w/ Steve. In reviewing the logs, the master of the vessel, Mike Crim, does seem to know + note the current, wind, + plume directions. He seems very conscientious + meticulous about reporting them + alters course →

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Pat Young OWD-5	Phone No.
1594	

5041-102
☆ U.S.G.P.O.: 1993 300-891/80018

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

2. there are any current changes during the disposal operations. However ~~the~~ the substitute captain is not as good.

In the permit we should include provision that they can do alternate disposal pattern if seas are too rough.

gdc

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Pat Young EPA Region 9 cc: Norman Wei/StarKist Foods 310-519-2805 cc: Jim Cox/Van Camp Seafood 619-597-4212	Steve Costa
COMPANY:	DATE:
U.S. Environmental Protection Agency	17 February 1997
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
415-744-1604	3
PHONE NUMBER:	TELEPHONE NUMBER:
415-744-1594	707-826-0717 or 826-7662
RE:	FAX NUMBER:
JCO Ocean Dumping Study	707-822-0567

☐ URGENT ☒ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

Pat,

I got your fax containing the final comments on the Ocean Dumping Model Report on Friday the 14th after returning home from travel. It seems that all issues are resolved (see attached memorandum). We have completed the reanalysis required and have most of the additional material inserted into the revised text. The major remaining work involves compiling, processing, and analyzing of the monitoring data. I will give you a call this week concerning schedule for publishing the revised report.

Regards,

Steve

P.O. BOX 1125, ARCATA, CA. 95518 – 1440 UNION STREET, ARCATA,CA 95521

MEMORANDUM

To: Pat Young/USEPA Region IX
(by Fax - original to follow)

From: Steve Costa/gdc

Subject: Ocean Dumping Studies - Final EPA Comments

Date: 17 February 1997

cc:

Norman Wei/StarKist Foods	Barry Mills/StarKist Samoa
Jim Cox/Van Camp Seafood	Bill Perez/VCS Samoa Packing
Karin Noack/CH2M HILL/SFO	Sheila Wiegman/ASEPA
Kyle Winslow/CH2M HILL/SFO	David Wilson/CH2M HILL/SEA

This memorandum is in response to Dr. Abdelrhman's memorandum of 2 February 1997 (provided as Attachment 1) concerning the American Samoa Ocean Dumping Study. It appears from his memorandum that all of the issues raised in the two rounds of previous comments by Dr. Abdelrhman have been resolved with the possible exception of how much emphasis should be given to the possibility of dumping operations that do not conform to the permit specified procedures. Dr. Abdelrhman had raised this issue in his second set of comments and we previously responded. In his latest memorandum he states:

> "3) Dilution values based on the central location of the dump site (1.5 n mi) must be included in the main text (e.g. Tables 4.1) unless justification is presented for using a location close to the site boundary (the 2.5 n mi location). At 1.5 n mi, farfield dilution reduces by 30-40% and final concentration is 60-70% higher than at 2.5 n mi."

In summary, Dr. Abdelrhman believes that the navigation of the vessel and/or the ability of the vessel operator to discern the current direction are potential problems and that we should use a shorter distance to the edge of the dumpsite to maintain a conservative approach in model predictions. There are three points that justify our specification of the dumpsite presented in the report. The first is a regulatory element, and the second two are operational details:

[1] The permit specifies in some detail where the disposal is to be done within the designated dump site (Special Condition 4.3.1 through 4.3.3). A computerized navigational system is required (Special Condition 4.5) and the permit further requires the master of the vessel to submit a plot of the vessel course for each dumping operation (Special Condition 4.3.4) and maintain and submit a detailed log of operations (Special Condition 4.3.7). Of particular interest are the requirements for the vessel positioning for disposal operations which are summarized as follows: first the vessel "...shall proceed directly to the center of

the disposal site"..; second, "...the master of the vessel shall observe the conditions at the dump site center, noting the vessel's position (latitude and longitude), wind direction and observed surface current direction..."; and, third "...the master of the disposal vessel shall proceed 1.1 nautical miles up current from the center of the disposal site and record the position of the disposal vessel (latitude and longitude). This position shall be the starting point for disposal operations..."

[2] The vessel navigation is done using GPS (and a plot is generated on each trip to the disposal site). Potential errors in navigation are on the order of 100 feet. Therefore, the master of the vessel will have no problem finding the center of the dump zone or positioning the vessel as described above.

[3] In addition, using GPS, observing the wind direction, and with a knowledgeable crew familiar with windage and current drift (which is the case here) near surface current direction is relatively easy to determine. If the determination of current direction is difficult or ambiguous there are a variety of methods (e.g. a drift pole with a radar reflector) that can be easily used from the disposal vessel to determine surface currents. We note that it is the surface current that is important for the dispersion of the wastes. The wastes are essentially neutrally to slightly positively buoyant (only a very small fraction, if any, will be significantly negatively buoyant). Therefore, any deeper currents. That might be in a different direction than the near surface layer, will not be important for dispersion in the dump zone.

We believe the points above provide justification for not discussing dilution based on disposal in the center of the dump site within the main text of the report. Such a discussion would implicitly suggest that EPA would accept disposal in a fashion not consistent with the permit. In addition, there is no operational reason that the vessel cannot position itself as required in the permit. Finally, the physical properties and processes involved are consistent with the intent of the permit in the context of disposal positioning and operations by correctly accounting for surface drift direction.

Therefore, we will include a discussion along the lines of that presented above and keep the disposal location as it is in the main text of the report. We will, however, mention the concerns of Dr. Abdelrhman and clearly point out that the information needed to assess the effects of dumping at various distances from the edge of the site is provided in the Appendix 10.

Rcd 7/3/97
Cpy to Allan Ota

gdc

COASTAL ENVIRONMENTAL ANALYSTS

2 July 1997

Pat Young
American Samoa Program Manager
Office of Pacific Island and native American Programs
Environmental Protection Agency
75 Hawthorne Street (E-4)
San Francisco, CA 94105

Dear Pat;

Re: Revised Ocean Dumping Report

Enclosed are two copies of the revised report on ocean dumping studies in American Samoa. I have reissued the entire report rather than just the modeling section to keep everything under one cover. The major changes include an extensive new section (Section 4) and appendix (Appendix 11) on the evaluation of monitoring data (and comparison to model results) and an greatly expanded section (Section 3) on modeling. I believe all of Dr. Abdelrhman's comments have been substantially and adequately addressed. I have forwarded by Federal Express a copy of the report directly to him and have distributed the report as described in the list below.

Sincerely,

Steve Costa

cc: Dr. Mohamed Abdelrhman/EPA/EAS/AED
Sheila Wiegman/ASEPA
Norman Wei/StarKist Foods
Jim Cox/Van Camp Seafood
Barry Mills/StarKist Samoa
Herman Gebauer/VCS Samoa Packing
Karin Noack/CH2M HILL
Kyle Winslow/CH2M HILL

P.O. BOX 1125 • ARCATA,CA • 95518
PHONE: 707-826-0717 or 7662 • FAX: 707-822-0567
EMAIL: GLATZELDACOST@SPRINTMAIL.COM

ROUTING AND TRANSMITTAL SLIP

Date 11/19

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. ~~Janet~~		
2. Allan		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Allan + I talked w/ Mohamed. He'd be willing to continue to assist us but needed OK from his boss; thus the new memo to Schimmel.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Pat	Phone No.

5041-102
☆ U.S.G.P.O.: 1993 300-891/80018

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 19, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report of the American Samoa Ocean Disposal Site for Fish Waste

FROM: Norman L. Lovelace, Chief
Office of Pacific Island Programs

TO: Steve Schimmel, Acting Branch Chief
Ecosystems Analysis and Simulation Branch, AED

We are very appreciative of Mohamed Abdelrhman's assistance in reviewing and commenting on the Joint Cannery Ocean Dumping Studies in American Samoa, and the thoroughness and timeliness of his review. As you know, Region 9 does not have the staff expertise to conduct such a technical review and Dr. Abdelrhman's assistance was most helpful. However, we would appreciate his continued involvement in reviewing this report (until it is finalized to his satisfaction). We forwarded his comments to Steve Costa, author of the study, for Dr. Costa's review, response and revision of the study. We recently received Dr. Costa's response (attached), in which he addresses Dr. Abdelrhman's comments and proposes changes to the report. He also states that in order to respond in more detail to some of the comments, he needs more information from Dr. Abdelrhman. Dr. Costa will issue a revised report upon our approval of his proposed changes and responses.

If Dr. Abdelrhman is able to continue to assist us in the review of this study it would be much appreciated. We understand that he will be on leave from November 22 through December 8th. If he is permitted to continue his assistance, please have him contact my staff, Pat Young, American Samoa Program Manager (415) 744-1594 upon his return. Thank you.

Enclosure

cc: Mohamed Abderlrman, AED

bc: Janet Hashimoto / Allan Ota

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 19, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report of the American Samoa Ocean Disposal Site for Fish Waste

FROM: Norman L. Lovelace, Chief
Office of Pacific Island Programs

TO: Mohamed A. Abdelrhman, Research Physical Scientist
Ecosystems Analysis and Simulation Branch, AED

Please accept my apologies for not acknowledging receipt of your technical comments on the report Joint Cannery Ocean Dumping Studies in American Samoa. Your review, conducted at our request, was very useful, as Region 9 does not have the technical expertise to review such documents, and we appreciated the quick response time. We should have acknowledged receipt of your comments in September, however, we had assumed your involvement would include review of the response by CH2M Hill to your comments. Perhaps that was an incorrect assumption on our part for which we apologize, and we would appreciate your continued assistance in this review.

Upon receipt of your comments, we reviewed them and forwarded them to Steve Costa, author of the study, for his review, response and revision of the study. We recently received his response (attached), in which he addresses your comments and proposes changes to the report. However, he states that in order to respond in more detail to some of your comments, he needs more information from you. Additionally, he will issue a revised report upon our approval of his proposed changes and responses.

Thus, in response to your memo of October 30th, we certainly would like to be able to continue receiving technical support from the Atlantic Ecology Division, as well as from other EPA research laboratories which have expertise in areas that Region 9 does not. If you are able to continue to assist us in the review of this study it would be much appreciated. My staff, Pat Young, American Samoa Program Manager (415) 744-1594 and Allan Ota of the Ocean Disposal Team (415) 744-1980, will contact you soon to discuss this. Please call me at (415) 744-1599 if I can be of assistance.

cc: Steve Schimmel, Acting Branch Chief, EAS, AED

bc: Janet Hashimoto

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL HEALTH AND ENVIRONMENTAL EFFECTS
RESEARCH LABORATORY
ATLANTIC ECOLOGY DIVISION
27 TARZWELL DRIVE • NARRAGANSETT, RI 02882

OFFICE OF
RESEARCH AND DEVELOPMENT

DATE: October 30, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report for EPA Region 9 - American Samoa Ocean Disposal Site for Fish Waste

FROM: Mohamed A. Abdelrhman, Research Physical Scientist
Ecosystems Analysis and Simulation Branch, AED

Mohamed A. Abdelrhman

TO: Norman Lovelace, Chief
Office of Pacific Island Programs

Upon your request (your memorandum of August 19, 1996), I reviewed the report *"Joint Cannery Ocean Dumping Studies in American Samoa"*. My technical comments were sent to you approximately two months ago (my memorandum dated September 3, 1996). Asa you know, I recommended that major corrections be made to the report.

The time and effort I put into the review was granted by my branch chief (Dr. Steve Schimmel) as Technical Assistance to Region 9. The time allocated for reviewing the report is not always easy to obtain, especially since I have many other duties and responsibilities at the laboratory. Hence, it is very important for our laboratory to determine if: a) you received our review; b) our review was useful to Region 9; and c) these Region 9/AED interactions should be continued in the future.

At your convenience inform us of your comments on the above-mentioned review. Your comments are important to us for similar future activities. If you have any questions or comments, please call me at (401) 782 3182.

CC: Steve Schimmel, Acting Branch Chief, EAS, AED

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 19, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report of the American Samoa Ocean Disposal Site for Fish Waste

FROM: Norman L. Lovelace, Chief
Office of Pacific Island Programs

TO: Steve Schimmel, Acting Branch Chief
Ecosystems Analysis and Simulation Branch, AED

We are very appreciative of Mohamed Abdelrhman's assistance in reviewing and commenting on the Joint Cannery Ocean Dumping Studies in American Samoa, and the thoroughness and timeliness of his review. As you know, Region 9 does not have the staff expertise to conduct such a technical review and Dr. Abdelrhman's assistance was most helpful. However, we would appreciate his continued involvement in reviewing this report (until it is finalized to his satisfaction). We forwarded his comments to Steve Costa, author of the study, for Dr. Costa's review, response and revision of the study. We recently received Dr. Costa's response (attached), in which he addresses Dr. Abdelrhman's comments and proposes changes to the report. He also states that in order to respond in more detail to some of the comments, he needs more information from Dr. Abdelrhman. Dr. Costa will issue a revised report upon our approval of his proposed changes and responses.

If Dr. Abdelrhman is able to continue to assist us in the review of this study it would be much appreciated. We understand that he will be on leave from November 22 through December 8th. If he is permitted to continue his assistance, please have him contact my staff, Pat Young, American Samoa Program Manager (415) 744-1594 upon his return. Thank you.

Enclosure

cc: Mohamed Abderlrman, AED

bc: Janet Hashimoto / Allan Ota

Rc'd 8/9/95
Alan Ota

CH2M HILL
Engineers
Planners
Economists
Scientists

7 August 1995

107091.DS.MD (OPE30702)

Patricia N.N. Young
American Samoa Program Manager
Office of Pacific Islands
and Native American Programs
U.S. Environmental Protection Agency
75 Hawthorne Street (E-4)
San Francisco, California 94105

Sheila Wiegman
American Samoa
Environmental Protection Agency
American Samoa Government
Pago Pago, American Samoa 96799

Dear Pat and Sheila:

Subject: **High Strength Waste Bioassay No. 3 and Summary of Modeling Results**

Enclosed find two copies of the following: [1] A memorandum presenting the results of the third high strength waste bioassay tests with the laboratory data attached, and [2] a memorandum summarizing the preliminary results of the modeling study for the ocean dumping operations. A full study report, including all documentation and backup, is in preparation at this time and should be delivered to USEPA and ASEPA by August 31, 1995.

If you have any questions please do not hesitate to call me. I will follow up with you in late August to discuss any of your comments or concerns.

Sincerely,

CH2M HILL

Steve Costa

Steven L. Costa
Project Manager

cc: Norman Wei/StarKist Foods
James Cox Van Camp Seafoods
Barry Mills/StarKist Samoa
Bill Perez/Samoa Packing

MEMORANDUM CH2MHILL

TO: Pat Young/USEPA

COPIES: Eugenia McNaughton/USEPA (w/ attachments)
Norman Wei/StarKist Foods (w/attachments)
James Cox/Van Camp Seafood (w/attachments)
Sheila Wiegman/American Samoa EPA (w/attachments)
Kurt Kline/ABT (w/o attachments)

FROM: Steve Costa/CH2M HILL/SFO
Karen Glatzel/Glatzel & Associates

DATE: 7 August 1995

SUBJECT: **Bioassay Testing of High Strength Waste: Starkist Samoa, Inc. and VCS Samoa Packing (23 June 1995 Sampling)**

PROJECT: 10702.DS.BT (OPE30702.DS.BT)

Three sets of bioassay tests with high strength waste (HSW) are required by Special Condition 3.3.5 of Starkist Samoa's and VCS Samoa Packing's ocean dumping permits. The results of the third set of tests are presented in the attached: "*Results of a Bioassay Conducted on Two High Strength Waste Samples from the Van Camp and Starkist Tuna Canneries in American Samoa*" prepared by Advanced Biological Testing Inc. (ABT), Tiburon, California, dated July 10, 1995 (Attachment No. 1). The third sampling was conducted on 23 June 1995. Sampling procedures were provided with the previous memorandum on the second sampling dated 26 January 1995.

Acute effluent bioassays were conducted on *Mysidopsis bahia* (mysid shrimp) juveniles and *Citharichthys stigmaeus* (speckled sanddab) juveniles using HSW collected separately from the Starkist Samoa and VCS Samoa Packing canneries in Pago Pago Harbor, American Samoa. The results of these bioassays are summarized in Table 1 below. Test results from the first set of tests (16 February 1994 sampling) and the second set of tests (20 October 1994 sampling) are included in the table for comparison. For this sampling *Mytilus edulis* (blue mussel) larvae were unavailable as the mussels were spawning. The U.S. EPA reviewed the problem of the mussel spawning and waived the requirement to conduct the bioassay test on the mussel larvae for this sampling period (Attachment No. 2).

After the first set of tests CH2M HILL and ABT recommended a number of changes to the HSW test protocol (see 26 January memo). The recommendation for reducing the maximum concentrations of the samples was accepted by U.S. EPA and after consultation between ABT and EPA new test concentrations were established for the mysid, mussel, and sanddab tests of 2.0, 1.0, 0.5, 0.25, 0.125, and 0.06% as a volume dilution in 30 ppt seawater. The recommendation for dropping the urchin test was accepted by U.S. EPA. The mussel test was continued to investigate the effects of aeration as described below.

In the first test (2/94) it was determined that due to the high oxygen demand, including a high immediate oxygen demand, of the effluent all test containers required aeration throughout the tests to maintain adequate oxygen concentrations. Aeration is standard protocol for bioassays on fish and invertebrates when oxygen levels fall below 40% of saturation, but is not standard protocol for bioassays on larval bivalves and echinoderms. Therefore, aerating the chambers containing *Mytilus edulis* may give problematic results.

In the second test (October 1994 sampling) gentle aeration was initiated on Day 0, and continued for the duration of the tests. To assess the effects of aeration, an aeration control for the mussel test was run simultaneously. No statistical differences were observed between aerated and unaerated controls. It was recommended that this type of aeration continue to be used with the mussel test to determine if a permanent change in the protocols for these samples should be made regarding aeration. Because the third test (23 June 1995 sampling) did not include the mussel test no changes in the protocol can be suggested at this time.

After review of the test results, we suggest Eugenia McNaughton contact Kurt Kline, Advanced Biological Testing Inc., directly at (415) 435-7878 to discuss any comments on the bioassay tests or the test protocols. Please contact Steve Costa, at (510) 251-2888 ext 2251, if there are any additional questions regarding this memo.

Table 1
Summary of High Strength Waste Bioassay Results.

Test Organism	Endpoint	Starkist Samoa			VCS Samoa Packing		
		2/94	10/94	6/95	2/94	10/94	6/95
Citharichthys stigmaeus (sanddab)	LC_{50}	0.27%	0.35%	0.396%	0.59%	0.37%	0.626%
	NOEC	0.20%	0.25%	0.25%	0.40%	0.25%	0.25%
	LOEC	0.40%	0.50%	0.50%	0.80%	0.50%	0.50%
Mysidopsis bahia (mysid shrimp)	LC_{50}	0.12%	1.16%	0.675%	0.59%	0.79%	0.625%
	NOEC	0.05%	0.50%	0.125%	0.05%	0.50%	0.25%
	LOEC	0.10%	1.00%	0.25%	0.10%	1.00%	0.50%
Mytilus edulis (blue mussel)	LC_{50}	>1.20%	>2.0%	[2]	>1.20%	>0.20%	[2]
	IC_{50}	<0.08%	0.10%	[2]	<0.08%	0.18%	[2]
Strongylocentrotus pupuratus (urchin)[1]	LC_{50}	1.20%	-	-	1.20%	-	-
	IC_{50}	<0.08%	-	-	0.10%	-	-

[1] Urchin test not conducted in 10/94 test period as per direction from U.S. EPA.
[2] Mussel larvae not available for test, requirement waived by U.S. EPA for this test.

ATTACHMENT 1

Laboratory Report of Bioassay Results for

High Strength Waste Sampling

23 June 1995

RESULTS OF BIOASSAYS CONDUCTED ON TWO HIGH-STRENGTH WASTE SAMPLES FROM THE VAN CAMP AND STARKIST TUNA CANNERIES IN AMERICAN SAMOA

Prepared for:

CH2M Hill California, Inc.
1111 Broadway
Oakland, CA 94607
Project # PDX 30702

Prepared by:

Advanced Biological Testing Inc.
98 Main St., # 419
Tiburon, Ca. 94920

July 10, 1995

Ref: 9309-8

1.0 INTRODUCTION

At the request of CH2M Hill (Project # PDX 30702), Advanced Biological Testing conducted acute effluent bioassay testing on *Mysidopsis bahia* and *Citharichthys stigmaeus* using high strength wastes (HSW) collected separately from the Starkist (HSW-1) and Van Camp (HSW-2) tuna canneries in American Samoa. The study was run using methods generally specified in EPA 1991 and in a Sampling and Testing Plan submitted to the EPA.

The study was conducted at the Advanced Biological Testing Laboratory in Tiburon, California, and was managed by Mr. Mark Fisler.

2.0 METHODS

2.1 EFFLUENT SAMPLING

The high strength wastes were sampled as composites on June 23, 1995 by personnel from the two canneries. Due to shipping and airline scheduling problems, frequently encountered in this region, the sample was received by the laboratory on June 26, 1995. A single gallon carboy was provided from each cannery and were labeled at ABT as HSW-1 (HSW-SKS Grab) and HSW-2 (Pipeline Sludge HS-W2, Van Camp). Samples were maintained in ice-filled coolers from the date of sampling until laboratory receipt. The samples were at 2-3°C upon receipt and were stored at 4°C until use.

2.2 SAMPLE PREPARATION AND TESTING METHODS

2.2.1 Testing on the speckled sanddab, *Citharichthys stigmaeus*

The bioassays were carried out on juvenile *Citharichthys stigmaeus*, supplied by J. Brezina and Associates in Dillon Beach, California. The animals were received at ABT on June 25, 1995. The test conditions are summarized in Table 1. Five replicates of each concentration were tested with ten juvenile fish per replicate. Water quality was monitored daily. Parameters measured included dissolved oxygen, pH, salinity, total ammonia, and temperature. In agreement with the EPA regarding the proposed testing concentrations, the high strength wastes were tested at six concentrations starting from 2.0% and dropping using a 50% dilution factor. The final concentrations were 2.0, 1.0, 0.5, 0.25, 0.125, and 0.06% as vol:vol dilutions in seawater. The diluent was filtered seawater from San Francisco Bay. The dilutions were brought up to the test temperature (17 ± 2°C) and aerated continuously. These effluents have an extremely high biological oxygen demand, therefore aeration was carried out from the beginning of the test.

A reference toxicant was run using concentrations of the toxicant Sodium Dodecyl Sulfonate (SDS) made up as a 2 grams per liter stock solution in distilled water. The tested concentrations were set at 25, 12.5, 6.25, 3.1, and 1.6 mg/L in 30 ppt seawater in a 24 hour test.

2.2.2 Testing on the mysid, *Mysidopsis bahia*

The bioassay was carried out on 3-5 day old larval *Mysidopsis bahia*, supplied by Aquatox from Hot Springs, Arkansas. The animals were received at ABT on June 27, 1994. The test conditions for this test are summarized in Table 2. Five replicates of each concentration were tested with ten larval mysids per replicate. Water quality was monitored daily as initial quality on Day 0 and final water quality on Days 1-4. Parameters measured included dissolved oxygen, pH, salinity, total ammonia, and temperature. In agreement with the EPA regarding the proposed testing concentrations, the high strength wastes were tested at six concentrations starting from 2.0% and dropping using a 50% dilution factor. The final concentrations were 2.0, 1.0, 0.5, 0.25, 0.125, and 0.06% as vol:vol dilutions in seawater. The diluent was filtered seawater from San Francisco Bay The dilutions were brought up to the test temperature (16 ± 2°C) and aerated continuously.

A reference toxicant was run using concentrations of the toxicant Sodium Dodecyl Sulfonate (SDS) made up as a 2 grams per liter stock solution in distilled water. The tested concentrations were set at 40, 20, 10, 5, 2.5 and 1.25 mg/L in 30 ppt seawater in a 96 hour test.

2.3 STATISTICAL ANALYSIS

At the conclusion of the testing, the survival data were evaluated statistically using ToxCalc™ to determine ECp, NOEC, and LOEC values where appropriate. ToxCalc™ is a comprehensive statistical application that follows standard guidelines for acute and chronic toxicity data analysis. Data were evaluated statistically to estimate the LC50 values for the tests using the Linear Interpolation (Bootstrap) or Trimmed Spearman-Karber methods.

3.0 RESULTS

3.1 Initial Effluent Quality

The two High Strength Wastes were tested for basic water quality parameters upon receipt at the laboratory. HSW-1 had a dissolved oxygen level of 0.8 mg/L; a pH of 6.49; a salinity of 23 ppt; and a total ammonia level of 380 mg/L. HSW-2 had a dissolved oxygen level of 1.4 mg/L; a pH of 6.71; a salinity of 17.0 ppt; and a total ammonia level of 220 mg/L.

3.2 *Citharichthys stigmaeus*

Water quality measurements were within the acceptable limits provided in EPA 1991. Temperature was maintained at 17 ± 2°C; pH remained relatively stable, and the salinity increased slightly as would be expected in a static test. The dissolved oxygen did drop as projected after test initiation in all of the concentration even with supplemental aeration and aeration was maintained in all chambers for the duration of the test. Ammonia was measured in all replicates from each concentration daily and was a potentially significant toxic component of the test for the highest three concentrations.

The LC50 for HSW-1 was 0.396% based upon a Trimmed Spearman-Karber method. The majority of the observed toxicity again occurred in the first 24 hours. There was significant mortality at 2.0, 1.0, and 0.5% concentrations compared to the control at 96 hours. The NOEC was 0.25% and the LOEC was 0.5%.

The LC50 for HSW-2 was 0.626% based upon a Trimmed Spearman-Karber method. The majority of the observed toxicity occurred in the first 24 hours. There was significant mortality at 2.0, 1.0, and 0.5% concentrations compared to the control at 96 hours. The NOEC was 0.25%, and the LOEC was 0.5%.

The reference toxicant test required the use of the Trimmed Spearman-Karber method and generated an LC50 of 4.05 mg/L, an NOEC of 3.2 mg/L, and an LOEC of 6.25 mg/L. This is the fifth reference toxicant test on *Citharichthys* at this laboratory, and the current laboratory mean is 3.95 mg/L (SD = 0.26 mg/L). The results are within one standard deviation of the laboratory mean, indicating a normally sensitive population.

3.3 *Mysidopsis bahia*

Water quality measurements were within the acceptable limits provided in EPA 1991. Temperature was maintained at 17 ± 2°C; pH remained relatively stable, and the salinity increased slightly as would be expected in a static test. The dissolved oxygen did drop as projected after test initiation in all of the concentration even with supplemental aeration and aeration was maintained in all chambers for the duration of the test. Ammonia was measured in all replicates from each concentration daily and was a potentially significant toxic component of the test for the highest three concentrations.

The LC50 for HSW-1 was 0.675%. At 96 hours, there was significant mortality at concentrations to 0.25% compared to the control. The NOEC was 0.125% and the LOEC was 0.25%.

The LC50 for HSW-2 was 0.625%. again there was significant mortality at 96 hours in the 2.0, 1.0 and 0.5% concentrations compared to the control. The NOEC was 0.25%, and the LOEC was 0.5%.

The reference toxicant test had an LC50 of 17.18 mg/L, with an NOEC of 10 mg/L and an LOEC of 20 mg/L. This is the tenth reference toxicant test on *Mysidopsis* at this laboratory, and the current laboratory mean is 14.29 mg/L (SD = 4.11 mg/L). The results are within one standard deviation of the laboratory mean, indicating a normally sensitive population.

3.4 AMMONIA MEASUREMENTS

Total ammonia in both of the HSW samples was very high. When measured in a 25% dilution in seawater, ammonia levels ranged from 55 to 95 mg/L. When converted to the 100% concentration, the ammonia level would be from 220 - 380 mg/L. The measured amount of total ammonia in the 2.0% concentrations on Day 0 in HSW-1 was 6.61 mg/L, and in HSW-2, 4.3 mg/L. In the 1.0% concentrations the total values were 3.32 mg/L and 2.10 mg/L respectively. These levels would be consistent with observed toxicity.

TABLE 1

Bioassay Procedure And Organism Data
For the Acute Bioassay
Using *Citharichthys stigmaeus* (U.S. EPA 1991)

Parameter	Data
Sample Identification	
Sample ID(s)	950626-1(HSW-1), 950626-2 (HSW-2)
Date Sampled	6/23/95
Date Received at ABT	6/26/95
Volume Received	One gallon
Sample Storage Conditions	4°C in the dark
Test Species	*Citharichthys stigmaeus*
Supplier	J. Brezina and Associates
Collection location	Tomales Bay
Date Acquired	June 25, 1995
Acclimation Time	48 hours
Acclimation Water	34 ppt seawater
Acclimation Temperature	17 ± 2°C
Age group	Juveniles, 3-5 cm TL
Test Procedures	
Type; Duration	96 hour static acute, renewal at 48 hours
Test Dates	6/27/95 to 7/1/95
Control Water	Bodega Bay seawater
Test Temperature	17 ± 2°C
Test Photoperiod	16 L : 8 D
Initial Salinity	34 ± 2 ppt
Test Chamber	10 L polyethylene chamber
Animals/Replicate	10 animals/replicate
Exposure Volume	5 L
Replicates/Treatment	5
Feeding	None
Deviations from procedures	None

TABLE 2

Bioassay Procedure And Organism Data
For the Acute Bioassay
Using *Mysidopsis bahia* (U.S. EPA 1991)

Parameter	Data
Sample Identification	
Sample ID(s)	950626-1(HSW-1), 950626-2 (HSW-2)
Date Sampled	6/23/95
Date Received at ABT	6/26/95
Volume Received	One gallon
Sample Storage Conditions	4°C in the dark
Test Species	*Mysidopsis bahia*
Supplier	Aquatox, Arkansas
Date Acquired	6/27/95
Acclimation Time	None
Acclimation Water	Shipping water
Acclimation Temperature/Salinity	20 ± 2°C/30-32 ppt salinity
Age group	3-5 day old larvae
Test Procedures	
Type; Duration	Acute; static; renewal at 48 hours
Test Dates	6/27/95 to 7/1/95
Control Water	San Francisco Bay seawater
Test Temperature	17 ± 2°C
Test Photoperiod	14 L : 10 D
Salinity	34 ± 2 ppt
Test Chamber	1000 mL jars
Animals/Replicate	10 animal/replicate
Exposure Volume	500 mL
Replicates/Treatment	5
Feeding	Brine shrimp (24 hr old nauplii)
Deviations from procedures	None

TABLE 4

Summary Of Effluent Toxicity
and
Results of the Reference Toxicity Testing

Species	Sample	LC50	95% Confidence Limits
Citharichthys	HSW-1	0.3959%	0.368% -0.426%
	HSW-2	0.6262%	0.569% -0.689%
	Ref Tox (SDS)	4.057 mg/L (acceptable)	3.51-4.69 mg/L
Mysidopsis	HSW-1	0.675%	0.563% -0.764%
	HSW-2	0.625%	0.549% -0.692%
	Ref Tox (SDS)	17.18 mg/L (acceptable)	Not calculated

4.0
REFERENCES

U.S. EPA. 1991. Methods for measuring acute toxicity of effluents to freshwater and marine organisms, 4th ed. EPA 600/4-90/027, September, 1991.

APPENDIX A

ANALYTICAL DATA

APPENDIX TABLE 1

Citharichthys stigmaeus
WATER QUALITY MEASUREMENTS FOR EFFLUENT TEST
Study Dates: 6/27 - 7/1/95
HSW-1

Concentration		Day 0					Day 1					Day 2					Day 3					Day 4				
(%)	Rep	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal
Control	1	8.07	9.1		16.4	33	8.14	8.0	<0.01	15.8	34	8.15	7.3	0.14	18.0	34	8.15	8.6	0.24	17.9	34	8.18	7.6	0.31	18.3	35
	2						8.07	7.8	<0.01	15.7	34	8.08	7.2	0.13	17.9	34	8.08	8.4	0.22	17.8	34	8.13	7.6	0.31	18.3	35
	3						8.01	7.2	<0.01	15.7	34	7.98	6.6	0.14	17.9	34	7.96	7.6	0.22	17.8	34	7.97	6.8	0.32	18.2	35
	4						8.08	7.8	<0.01	15.6	34	8.09	7.2	0.14	17.8	34	8.11	8.4	0.22	17.7	34	8.12	7.5	0.32	18.2	36
	5						8.11	7.8	<0.01	15.6	34	8.12	7.2	0.14	17.9	34	8.12	8.4	0.21	17.9	34	8.14	7.5	0.31	18.3	35
0.06	1	8.03	9.0	0.25	16.3	34	7.88	7.2	0.17	15.7	34	7.99	6.8	0.21	17.9	34	7.92	7.6	0.32	18.0	34	7.96	7.0	0.45	18.4	37
	2						7.99	7.8	0.19	15.5	34	8.09	6.9	0.24	17.8	34	8.09	8.2	0.35	17.9	34	8.13	7.6	0.49	18.3	38
	3						7.95	7.8	0.17	15.6	34	8.08	7.1	0.20	17.9	34	8.03	8.2	0.33	18.2	34	8.06	7.3	0.50	18.6	37
	4						7.97	7.8	0.20	15.5	34	8.09	7.2	0.26	17.9	34	8.09	8.2	0.40	17.7	34	8.12	7.5	0.55	18.0	38
	5						7.92	7.4	0.18	15.5	34	8.04	7.2	0.22	17.8	34	8.02	8.2	0.32	17.7	34	8.05	7.4	0.48	18.0	37
0.125	1	7.99	9.1	0.48	16.2	34	7.80	6.6	0.29	15.5	34	8.02	6.8	0.30	17.8	34	8.04	8.2	0.41	17.8	34	8.06	7.4	0.61	18.6	37
	2						7.84	6.8	0.28	15.5	34	8.04	7.0	0.33	17.8	34	8.06	8.2	0.49	17.9	34	8.10	7.4	0.68	18.2	37
	3						7.80	6.6	0.28	15.6	34	8.02	7.0	0.31	17.9	34	8.04	8.2	0.45	17.9	34	8.07	7.5	0.63	18.4	36
	4						7.90	6.4	0.29	15.4	34	8.09	7.2	0.32	17.6	34	8.13	8.2	0.44	17.8	34	8.15	7.4	0.64	18.2	38
	5						7.75	5.4	0.30	15.5	34	7.96	6.6	0.32	17.9	34	7.96	8.2	0.46	18.2	34	8.02	6.9	0.65	18.6	37
0.25	1	7.90	9.0	0.94	16.2	34	7.68	6.6	0.52	15.8	34	8.06	6.8	0.48	18.0	34	8.03	8.0	0.57	18.0	34	8.09	7.4	0.84	18.4	37
	2						7.62	5.8	0.52	15.7	34	8.03	6.8	0.48	18.0	34	8.01	8.0	0.59	18.0	34	8.07	7.3	0.84	18.4	36
	3						7.54	4.8	0.51	15.8	34	7.97	6.6	0.46	18.0	34	7.96	7.8	0.55	18.0	34	8.00	7.2	0.83	18.4	38
	4						7.55	4.8	0.52	15.7	34	7.95	6.6	0.56	18.0	34	7.95	7.6	0.55	17.9	34	7.99	7.0	0.92	18.4	36
	5						7.57	6.0	0.51	15.7	34	8.01	6.8	0.47	17.9	34	7.99	7.8	0.58	18.0	34	8.05	7.0	0.82	18.4	36
0.5	1	7.83	9.0	1.80	16.2	34	7.54	4.4	1.20	15.7	34	7.90	6.0	1.00	18.0	34	—	—	—	—	—	—	—	—	—	—
	2						7.48	4.3	1.19	15.7	34	7.85	5.9	1.08	18.0	34	—	—	—	—	—	—	—	—	—	—
	3						7.45	4.4	1.22	15.6	34	7.88	6.0	1.02	17.9	34	—	—	—	—	—	—	—	—	—	—
	4						7.52	4.1	1.18	15.7	34	7.86	5.6	1.02	18.0	34	—	—	—	—	—	—	—	—	—	—
	5						7.56	4.0	1.20	15.6	34	7.95	6.4	0.83	17.9	34	8.03	7.9	0.93	18.0	34	8.06	7.2	1.19	18.3	37
1	1	7.52	8.8	3.42	16.2	34	7.45	2.3	2.75	15.7	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2						7.41	0.8	2.78	15.6	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3						7.39	1.2	2.72	15.6	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4						7.40	0.4	2.73	15.1	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5						7.41	0.4	2.73	15.7	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	1	7.46	8.8	6.60	16.2	34	7.43	1.0	5.87	15.7	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2						7.50	2.8	5.84	15.4	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3						7.45	0.8	5.79	15.5	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4						7.45	3.2	5.80	15.5	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5						7.52	2.4	5.88	15.6	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Min		7.46	8.8	0.25	16.2	33	7.39	0.4	<0.01	15.1	34	7.85	5.6	0.13	17.6	34	7.92	7.6	0.21	17.7	34	7.96	6.8	0.31	18.0	35
Max		8.07	9.1	6.60	16.4	34	8.14	8.0	5.88	15.8	34	8.15	7.3	1.08	18.0	34	8.15	8.6	0.93	18.2	34	8.18	7.6	1.19	18.6	38

Note: — = All animals dead.

APPENDIX TABLE 1 (Cont'd)

Citharichthys stigmaeus
WATER QUALITY MEASUREMENTS FOR EFFLUENT TEST
Study Dates: 6/27 - 7/1/95
HSW-2

Concentration		Day 0					Day 1					Day 2					Day 3					Day 4				
(%)	Rep	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal
0.06	1	8.02	9.0	0.17	16.3	34	7.98	7.6	0.20	15.5	34	8.06	7.0	0.19	17.9	34	7.99	8.2	0.34	17.8	34	8.08	7.3	0.47	18.8	37
	2						8.04	7.6	0.20	15.2	34	8.13	7.2	0.19	17.7	34	8.13	8.3	0.29	17.6	34	8.17	7.4	0.42	17.9	38
	3						8.05	7.8	0.20	15.2	34	8.14	7.3	0.19	17.7	34	8.13	8.4	0.29	17.6	34	8.15	7.6	0.41	18.0	37
	4						8.00	7.6.	0.19	15.4	34	8.06	7.1	0.19	17.9	34	8.06	8.4	0.29	17.8	34	8.07	7.3	0.41	18.2	37
	5						7.94	7.6	0.18	15.3	34	8.02	6.8	0.20	17.9	34	8.01	8.2	0.37	17.9	34	8.04	7.4	0.47	18.2	37
0.125	1	8.05	9.2	0.29	16.2	34	7.98	7.6	0.29	15.4	34	8.13	7.2	0.28	17.9	34	8.11	8.2	0.42	17.9	34	8.15	7.4	0.53	18.2	38
	2						7.93	7.5	0.19	15.4	34	8.08	7.1	0.25	18.0	34	8.07	8.4	0.36	18.0	34	8.09	7.5	0.48	18.5	37
	3						7.91	6.4	0.21	15.6	34	8.09	7.2	0.25	18.3	34	8.07	8.2	0.34	18.2	34	8.10	7.4	0.45	18.6	37
	4						7.78	7.4	0.22	15.5	34	7.99	6.6	0.25	18.1	34	7.94	7.6	0.35	18.0	34	7.94	6.6	0.45	18.3	37
	5						7.88	4.5	0.22	15.5	34	8.06	7.0	0.23	18.0	34	8.04	8.2	0.34	18.0	34	8.08	7.3	0.43	18.3	36
0.25	1	7.98	9.1	0.62	16.2	34	7.74	4.8	0.38	15.5	34	8.01	6.6	0.37	18.0	34	7.94	8.2	0.52	18.0	34	8.03	7.1	0.64	18.2	36
	2						7.78	5.8	0.38	15.3	34	8.07	7.0	0.34	18.0	34	8.03	8.0	0.48	17.9	34	8.11	7.2	0.58	18.2	37
	3						7.77	5.8	0.36	*15.3	34	8.05	7.0	0.35	18.0	34	8.01	8.2	0.49	17.9	34	8.06	7.2	0.60	18.2	37
	4						7.77	5.9	0.37	15.2	34	8.06	6.7	0.38	17.9	34	8.02	8.0	0.56	17.7	34	8.10	7.1	0.70	18.0	37
	5						7.83	6.6	0.38	15.2	34	8.10	7.0	0.36	17.8	34	8.07	8.2	0.55	17.6	34	8.14	7.5	0.62	17.9	37
0.5	1	7.91	9.0	1.18	16.0	34	7.79	5.6	0.78	15.2	34	8.09	7.0	0.58	17.9	34	8.07	8.2	0.74	17.7	34	8.13	7.5	0.89	18.0	38
	2						7.78	6.0	0.79	15.0	34	8.11	7.1	0.58	17.6	34	8.09	8.4	0.72	17.9	34	8.15	7.5	0.88	18.2	38
	3						7.59	6.0	0.84	15.5	34	8.06	7.0	0.61	18.1	34	8.08	8.2	0.74	18.0	34	8.12	7.4	0.88	18.3	36
	4						7.69	4.9	0.82	15.4	34	8.05	6.8	0.64	18.2	34	8.05	8.0	0.77	18.0	34	8.12	7.2	0.99	18.2	37
	5						7.73	5.3	0.81	15.3	34	8.09	6.8	0.57	18.2	34	8.07	8.0	0.75	18.0	34	8.14	7.2	0.86	18.3	37
1	1	7.63	9.0	2.21	16.0	34	7.64	1.0	1.39	15.4	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2						7.59	1.1	1.37	15.5	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3						7.52	0.8	1.79	15.5	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4						7.48	0.6	1.70	15.4	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5						7.47	1.0	1.71	15.4	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.0	1	7.42	8.6	4.33	16.0	34	7.44	0.6	3.60	15.4	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2						7.43	0.6	3.54	15.3	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3						7.45	0.4	3.39	15.2	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4						7.44	0.6	3.25	15.0	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5						7.47	0.6	3.35	15.1	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Min		7.42	8.6	0.17	16.0	34	7.43	0.4	0.18	15.0	34	7.99	6.6	0.19	17.6	34	7.94	7.6	<0.10	17.6	34	7.94	6.6	0.41	17.9	36
Max		8.05	9.2	4.33	16.3	34	8.05	7.8	3.60	15.6	34	8.14	7.3	0.64	18.3	34	8.13	8.4	0.77	18.2	34	8.17	7.6	0.99	18.8	38

Note: — = All animals dead.

APPENDIX TABLE 2

Citharichthys stigmaeus
SURVIVAL DATA FOR EFFLUENT TEST
HSW-1

Concentration (%)	Rep	Initial Added	Day 1	Day 2	Day 3	Day 4	% Survival	Average % Survival
Control	1	10	10	9	9	9	90	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	98.0
0.06	1	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	10	10	9	90	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	98.0
0.125	1	10	10	10	10	10	100	
	2	10	10	10	9	9	90	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	98.0
0.25	1	10	10	10	10	10	100	
	2	10	9	9	9	9	90	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	98.0
0.5	1	10	9	0	—	—	0	
	2	10	10	0	—	—	0	
	3	10	8	0	—	—	0	
	4	10	10	0	—	—	0	
	5	10	8	8	8	8	80	16.0
1	1	10	0	—	—	—	0	
	2	10	0	—	—	—	0	
	3	10	0	—	—	—	0	
	4	10	0	—	—	—	0	
	5	10	0	—	—	—	0	0.0
2	1	10	0	—	—	—	0	
	2	10	0	—	—	—	0	
	3	10	0	—	—	—	0	
	4	10	0	—	—	—	0	
	5	10	0	—	—	—	0	0.0

Note: — = All animals dead.

APPENDIX TABLE 2 (Cont'd)

Citharichthys stigmaeus
SURVIVAL DATA FOR EFFLUENT TEST
HSW-2

Concentration (%)	Rep	Initial Added	Day 1	Day 2	Day 3	Day 4	% Survival	Average % Survival
0.06	**1**	10	10	10	9	9	90	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	10	10	10	9	90	96.0
0.125	**1**	10	10	10	10	9	90	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	10	9	90	
	5	10	9	9	9	8	80	92.0
0.25	**1**	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	9	9	8	80	
	4	10	9	9	9	8	80	
	5	10	9	9	9	9	90	90.0
0.5	**1**	10	10	10	10	8	80	
	2	10	10	10	10	10	100	
	3	10	10	9	9	9	90	
	4	10	10	10	10	10	100	
	5	10	9	9	9	9	90	92.0
1	**1**	10	0	—	—	—	0	
	2	10	0	—	—	—	0	
	3	10	0	—	—	—	0	
	4	10	0	—	—	—	0	
	5	10	0	—	—	—	0	0.0
2	**1**	10	0	—	—	—	0	
	2	10	0	—	—	—	0	
	3	10	0	—	—	—	0	
	4	10	0	—	—	—	0	
	5	10	0	—	—	—	0	0.0

Note: — = All animals dead.

APPENDIX TABLE 3

Citharichthys stigmaeus
WATER QUALITY MEASUREMENTS
FOR REFERENCE TOXICANT (S.D.S) TEST

Concentration		Day 0				Day 1			
(mg/L)	Rep	pH	DO	°C	Sal	pH	DO	°C	Sal
Control	**1**	8.03	9.0	16.8	34	7.55	5.0	16.2	34
	2					7.55	5.0	16.2	34
	3					7.55	5.0	16.2	34
1.6	**1**	8.03	9.0	16.9	34	7.53	4.9	16.1	34
	2					7.51	4.9	16.2	34
	3					7.53	4.8	16.2	34
3.1	**1**	8.03	8.9	17.0	34	7.49	4.8	16.2	34
	2					7.44	4.8	16.2	34
	3					7.49	4.7	16.2	34
6.25	**1**	8.04	8.8	16.7	34	7.49	4.7	16.2	34
	2					7.50	4.7	16.2	34
	3					7.57	4.7	16.2	34
12.5	**1**	8.05	8.8	16.7	34	7.44	4.5	16.2	34
	2					7.39	4.6	16.2	34
	3					7.36	4.7	16.2	34
25	**1**	8.05	8.8	16.6	34	7.33	4.8	16.2	34
	2					7.32	4.9	16.2	34
	3					7.30	4.9	16.3	34
Min		8.03	8.8	16.6	34	7.30	4.5	16.1	34
Max		8.05	9.0	17.0	34	7.57	5.0	16.3	34

APPENDIX TABLE 4

Citharichthys stigmaeus
SURVIVAL DATA
FOR REFERENCE TOXICANT (S.D.S.) TEST

Concentration (mg/L)	Rep	Initial Added	Day 1	% Survival	Average % Survival
Control	**1**	4	4	100	
	2	4	4	100	
	3	4	2	50	83.3
1.6	**1**	4	4	100	
	2	4	4	100	
	3	4	3	75	91.7
3.1	**1**	4	3	75	
	2	4	3	75	
	3	4	3	75	75.0
6.25	**1**	4	0	0	
	2	4	0	0	
	3	4	0	0	0.0
12.5	**1**	4	0	0	
	2	4	0	0	
	3	4	0	0	0.0
25	**1**	4	0	0	
	2	4	0	0	
	3	4	0	0	0.0

APPENDIX TABLE 5

Mysidopsis bahia
WATER QUALITY MEASUREMENTS FOR EFFLUENT TEST
Study Dates: 6/27 - 7/1/95
HSW-1

Concentration		Day 0					Day 1					Day 2					Day 3					Day 4				
(%)	Rep	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal
Control	1	8.07	9.0		17.1	34	8.11	8.0	<0.01	16.5	34	8.25	7.4		18.2	34	8.17	8.4		18.0	34	8.20	7.7		18.3	36
	2						8.14	8.0		16.3	34	8.23	7.4	0.02	18.3	34	8.18	8.6		18.0	34	8.20	7.7		18.4	36
	3						8.13	8.0		16.3	34	8.17	7.4		18.3	34	8.09	8.6	0.03	18.1	34	8.13	7.7		18.4	35
	4						8.14	8.0		16.4	34	8.22	7.4		18.3	34	8.24	8.6		18.1	34	8.20	7.6	0.06	18.5	35
	5						8.16	8.0		16.4	34	8.24	7.4		18.2	34	8.28	8.6		18.0	34	8.26	7.7		18.3	36
0.06	1	8.02	9.0	0.25	17.9	34	7.98	7.8	0.11	16.2	34	8.10	7.2		18.3	34	8.14	8.6		18.0	34	8.11	7.4		18.4	35
	2						8.06	7.8		16.1	34	8.17	7.2	0.08	18.2	34	8.18	8.6		18.0	34	8.15	7.6		18.2	36
	3						8.04	7.8		16.0	34	8.13	7.2		18.2	34	8.12	8.6	0.11	17.9	34	8.11	7.5		18.2	35
	4						8.06	7.8		16.1	34	8.18	7.2		18.2	34	8.17	8.6		17.9	34	8.15	7.5	0.14	18.2	36
	5						8.12	8.0		16.1	34	8.22	7.3		18.2	34	8.22	8.7		17.9	34	8.20	7.6		18.2	36
0.125	1	7.96	8.8	0.48	18.0	34	7.78	6.2	0.22	16.2	34	8.16	7.2		18.2	34	8.13	8.6		18.0	34	8.13	7.6		18.4	35
	2						7.73	6.2		16.2	34	7.95	5.9	0.15	18.2	34	7.90	8.6		17.9	34	8.00	6.6		18.2	35
	3						7.98	7.8		16.1	34	8.10	7.0		18.1	34	8.14	8.4	0.22	17.9	34	8.10	7.5		18.2	35
	4						8.02	7.8		16.0	34	8.18	7.2		18.2	34	8.18	8.6		17.8	34	8.17	7.5	0.26	18.2	35
	5						7.94	7.6		16.2	34	8.14	7.2		18.3	34	8.16	8.6		17.9	34	8.14	7.6		18.3	35
0.25	1	7.90	8.8	0.94	18.0	34	7.75	7.1	0.41	16.2	34	8.04	7.0		18.2	34	8.10	8.5		18.0	34	8.08	7.5		18.4	35
	2						7.82	7.5		16.2	34	8.10	7.0	0.32	18.2	34	8.14	8.4		17.9	34	8.11	7.4		18.2	35
	3						7.86	7.4		16.1	34	8.13	7.2		18.1	34	8.13	8.6	0.47	17.8	34	8.12	7.4		18.2	35
	4						7.95	7.6		16.1	34	8.20	7.4		18.2	34	8.22	8.6		17.7	34	8.20	7.5	0.51	18.2	35
	5						7.90	7.4		16.2	34	8.12	7.2		18.3	34	8.14	8.6		17.9	34	8.14	7.6		18.3	35
0.5	1	7.92	8.8	1.80	17.9	34	7.80	6.9	0.81	16.3	34	8.20	7.2		18.2	34	8.25	8.6		18.0	34	8.23	7.4		18.4	35
	2						7.82	7.3		16.2	34	8.22	7.2	0.63	18.0	34	8.28	8.6		17.9	34	8.23	7.3		18.3	35
	3						7.74	6.2		16.2	34	8.17	7.1		18.0	34	8.23	8.6	0.83	17.9	34	8.26	7.4		18.2	35
	4						7.66	5.5		16.1	34	8.20	7.2		18.2	34	8.26	8.6		17.9	34	8.21	7.4	0.93	18.3	35
	5						7.71	6.2		16.2	34	8.20	7.2		18.3	34	8.30	8.6		17.9	34	8.25	7.4		18.3	36
1	1	7.74	8.6	3.41	17.9	34	7.64	2.8	1.91	16.3	34	8.12	6.6		18.4	34	—	—		—	—	—	—		—	—
	2						7.64	3.4		16.2	34	8.14	6.6	1.32	18.4	34	8.23	8.6		18.2	34	8.24	7.3		18.5	35
	3						7.65	3.6		16.2	34	8.15	6.7		18.3	34	8.26	8.6	1.54	18.0	34	8.29	7.4		18.4	35
	4						7.63	3.2		16.3	34	8.11	6.6		18.4	34	—	—		—	—	—	—		—	—
	5						7.64	3.6		16.2	34	8.13	6.6		18.5	34	8.29	8.6		18.1	34	8.31	7.3	1.61	18.4	35
2.0	1	7.63	8.8	6.60	17.6	34	7.46	1.2	3.51	16.5	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2						7.44	1.0		16.3	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	3						7.45	2.0		16.2	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4						7.50	2.7		16.2	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	5						7.46	0.6		16.4	34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Min		7.63	8.6	0.25	17.1	34	7.44	0.6	<0.01	16.0	34	7.95	5.9	0.02	18.0	34	7.90	8.4	0.03	17.7	34	8.00	6.6	0.06	18.2	35
Max		8.07	9.0	6.60	18.0	34	8.16	8.0	3.51	16.5	34	8.25	7.4	1.32	18.5	34	8.30	8.7	1.54	18.2	34	8.31	7.7	1.61	18.5	36

Note: — = All animals dead.

APPENDIX TABLE 5 (Cont'd)

Mysidopsis bahia
WATER QUALITY MEASUREMENTS FOR EFFLUENT TEST
Study Dates: 6/27 - 7/1/95
HSW-2

Concentration		Day 0					Day 1					Day 2					Day 3					Day 4				
(%)	Rep	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal	pH	DO	NH3	°C	Sal
0.06	1	8.01	9.0	0.17	18.6	34	8.07	7.8	0.19	16.5	34	8.22	7.1		18.4	34	8.18	8.4		18.0	34	8.22	7.7		18.5	35
	2						8.07	7.6		16.4	34	8.18	7.2	0.09	18.4	34	8.15	8.6		18.0	34	8.16	7.6		18.4	35
	3						8.10	7.8		16.4	34	8.20	7.3		18.4	34	8.18	8.6	0.12	17.9	34	8.18	7.6		18.3	35
	4						8.12	7.8		16.3	34	8.22	7.4		18.3	34	8.20	8.6		17.9	34	8.20	7.7	0.15	18.2	35
	5						8.16	7.8		16.3	34	8.24	7.4		18.3	34	8.22	8.6		18.0	34	8.23	7.7		18.3	35
0.125	1	8.02	9.0	0.29	18.6	34	8.12	7.8	0.20	16.4	34	8.23	7.4		18.4	34	8.20	8.6		17.9	34	8.22	7.7		18.4	35
	2						8.14	7.8		16.4	34	8.25	7.3	0.12	18.3	34	8.20	8.6		17.9	34	8.25	7.8		18.3	35
	3						8.05	7.6		16.3	34	8.18	7.2		18.3	34	8.13	8.6	0.18	17.9	34	8.16	7.6		18.2	35
	4						8.09	7.8		16.2	34	8.20	7.3		18.2	34	8.20	8.6		17.9	34	8.22	7.6	0.20	18.2	35
	5						8.12	7.8		16.2	34	8.24	7.4		18.2	34	8.21	8.6		17.9	34	8.23	7.6		18.2	35
0.25	1	7.97	9.0	0.62	18.6	34	7.93	7.0	0.36	16.4	34	8.16	7.2		18.4	34	8.11	8.4		17.9	34	8.18	7.6		18.4	35
	2						7.92	7.4		16.3	34	8.17	7.2	0.25	18.3	34	8.14	8.4		17.9	34	8.22	7.6		18.2	35
	3						7.92	7.3		16.2	34	8.18	7.2		18.3	34	8.12	8.4	0.36	17.9	34	8.21	7.6		18.2	35
	4						8.02	7.4		16.2	34	8.22	7.4		18.2	34	8.12	8.5		17.9	34	8.25	7.6	0.41	18.2	35
	5						8.01	7.6		16.2	34	8.24	7.4		18.2	34	8.21	8.6		17.9	34	8.25	7.7		18.2	35
0.5	1	7.94	9.0	1.18	18.6	34	7.93	6.8	0.62	16.4	34	8.26	7.3		18.3	34	8.22	8.6		17.9	34	8.27	7.6		18.3	36
	2						7.90	6.4		16.3	34	8.25	7.3	0.51	18.3	34	8.20	8.4		17.9	34	8.27	7.6		18.2	35
	3						7.86	6.1		16.2	34	8.22	7.2		18.3	34	8.20	8.6	0.64	17.9	34	8.26	7.5		18.2	35
	4						7.80	4.8		16.3	34	8.22	7.2		18.2	34	8.18	8.5		17.9	34	8.26	7.6	0.73	18.2	35
	5						7.75	4.7		16.2	34	8.18	7.2		18.2	34	8.04	8.4		17.9	34	8.17	7.6		18.2	35
1	1	7.84	8.8	2.21	18.6	34	7.77	6.4	1.33	16.4	34	8.23	7.2		18.3	34	8.27	7.9		17.9	34	8.28	7.4		18.3	35
	2						7.66	5.0		16.3	34	8.15	7.0	1.06	18.3	34	8.26	8.3		17.9	34	8.27	7.4		18.3	35
	3						7.69	6.2		16.3	34	8.18	7.0		18.3	34	8.29	8.4	1.19	17.9	34	8.29	7.4		18.2	35
	4						7.70	5.4		16.2	34	8.20	7.0		18.2	34	8.26	8.6		17.9	34	8.24	7.2	1.36	18.2	35
	5						7.68	5.8		16.2	34	8.19	7.0		18.2	34	8.27	8.6		17.9	34	8.23	7.2		18.2	35
2.0	1	7.72	8.6	4.33	18.5	34	7.64	1.6	2.80	16.4	34	8.22	7.0		18.4	34	—	—	—	—	—	—	—	—	—	—
	2						7.60	0.6		16.3	34	8.16	6.1	2.26	18.3	34	—	—	—	—	—	—	—	—	—	—
	3						7.62	1.6		16.3	34	8.16	6.7		18.3	34	—	—	—	—	—	—	—	—	—	—
	4						7.58	0.4		16.3	34	8.12	6.4		18.3	34	—	—	—	—	—	—	—	—	—	—
	5						7.55	0.4		16.3	34	8.11	6.2		18.2	34	—	—	—	—	—	—	—	—	—	—
Min		7.72	8.6	0.17	18.5	34	7.55	0.4	0.19	16.2	34	8.11	6.1	0.09	18.2	34	8.04	7.9	0.12	17.9	34	8.16	7.2	0.15	18.2	35
Max		8.02	9.0	4.33	18.6	34	8.16	7.8	2.80	16.5	34	8.26	7.4	2.26	18.4	34	8.29	8.6	1.19	18.0	34	8.29	7.8	1.36	18.5	36

Note: — = All animals dead.

APPENDIX TABLE 6

Mysidopsis bahia
SURVIVAL DATA FOR EFFLUENT TEST
HSW-1

Concentration (%)	Rep	Initial Added	Day 1	Day 2	Day 3	Day 4	% Survival	Average % Survival
Control	1	10	9	9	9	9	90	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	98.0
0.06	1	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	100.0
0.125	1	10	9	9	9	9	90	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	10	10	100	
	5	10	9	9	9	9	90	96.0
0.25	1	10	10	*	*	7	70	
	2	10	10	*	*	10	100	
	3	10	10	*	*	8	80	
	4	10	9	*	*	6	60	
	5	10	10	*	*	10	100	82.0
0.5	1	10	*	*	*	5	50	
	2	10	*	*	*	7	70	
	3	10	*	*	*	7	70	
	4	10	*	*	*	10	100	
	5	10	*	*	*	8	80	74.0
1	1	10	*	0	—	—	0	
	2	10	*	*	*	2	20	
	3	10	*	*	*	0	0	
	4	10	*	0	—	—	0	
	5	10	*	*	*	0	0	4.0
2	1	10	0	—	—	—	0	
	2	10	0	—	—	—	0	
	3	10	0	—	—	—	0	
	4	10	0	—	—	—	0	
	5	10	0	—	—	—	0	0.0

Notes: — = All animals dead.
* Sample too turbid to do counts.

APPENDIX TABLE 6 (Cont'd)

Mysidopsis bahia
SURVIVAL DATA FOR EFFLUENT TEST
HSW-2

Concentration (%)	Rep	Initial Added	Day 1	Day 2	Day 3	Day 4	% Survival	Average % Survival
0.06	1	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	
	4	10	10	10	9	9	90	
	5	10	10	9	9	9	90	96.0
0.125	1	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	10	10	9	90	
	4	10	10	10	10	10	100	
	5	10	10	10	10	10	100	98.0
0.25	1	10	*	*	10	10	100	
	2	10	*	*	10	9	90	
	3	10	*	*	10	10	100	
	4	10	*	*	9	9	90	
	5	10	*	*	10	10	100	96.0
0.5	1	10	*	*	*	5	50	
	2	10	*	*	*	6	60	
	3	10	*	*	*	7	70	
	4	10	*	*	*	7	70	
	5	10	*	*	*	6	60	62.0
1	1	10	*	*	*	1	10	
	2	10	*	*	*	0	0	
	3	10	*	*	*	2	20	
	4	10	*	*	*	0	0	
	5	10	*	*	*	2	20	10.0
2	1	10	*	0	—	—	0	
	2	10	*	0	—	—	0	
	3	10	*	0	—	—	0	
	4	10	*	0	—	—	0	
	5	10	*	0	—	—	0	0.0

Notes: — = All animals dead.
* Sample too turbid to do counts.

APPENDIX TABLE 7

Mysidopsis bahia
WATER QUALITY MEASUREMENTS
FOR REFERENCE TOXICANT (S.D.S) TEST

Concentration		Day 0				Day 1				Day 2				Day 3				Day 4			
(mg/L)	Rep	pH	DO	°C	Sal	pH	DO	°C	Sal	pH	DO	°C	Sal	pH	DO	°C	Sal	pH	DO	°C	Sal
0.7	1	8.07	9.0	17.5	34	8.11	7.8	16.5	34	8.09	6.8	18.6	34	7.98	7.8	18.4	34	7.77	6.3	18.7	35
	2					8.10	7.8	16.3	34	8.08	6.8	18.5	34	8.00	8.0	18.2	34	7.82	6.5	18.6	35
	3					8.10	7.7	16.2	34	8.07	6.6	18.4	34	8.00	8.0	18.0	34	7.84	6.4	18.5	35
1.25	1	8.08	9.0	17.6	34	8.07	7.3	16.4	34	8.04	6.4	18.5	34	7.97	8.0	18.2	34	7.84	6.5	18.6	35
	2					8.08	7.3	16.4	34	8.05	6.6	18.5	34	7.98	7.8	18.2	34	7.85	6.4	18.6	35
	3					8.08	7.3	16.2	34	8.06	6.6	18.4	34	7.98	7.8	18.1	34	7.85	6.4	18.6	35
2.5	1	8.08	9.2	17.6	34	8.05	7.0	16.4	34	8.03	6.6	18.5	34	7.96	7.8	18.2	34	7.86	6.2	18.5	35
	2					8.04	6.8	16.3	34	8.03	6.6	18.5	34	7.97	7.8	18.1	34	7.87	6.3	18.5	35
	3					8.04	6.8	16.2	34	8.04	6.6	18.5	34	7.98	7.8	18.1	34	7.87	6.3	18.5	35
5	1	8.08	9.2	17.6	34	7.99	6.0	16.5	34	7.96	6.0	18.5	34	7.89	7.0	18.2	34	7.84	5.8	18.6	35
	2					7.98	5.8	16.4	34	7.96	6.0	18.5	34	7.90	7.1	18.1	34	7.80	5.7	18.5	35
	3					7.98	5.8	16.2	34	7.98	6.2	18.5	34	7.92	7.3	18.1	34	7.81	5.8	18.5	35
10	1	8.08	9.2	17.6	34	7.93	5.0	16.5	34	7.87	5.2	18.6	34	7.87	7.3	18.2	34	7.82	6.0	18.6	35
	2					7.92	5.1	16.3	34	7.83	5.2	18.5	34	7.86	7.3	18.1	34	7.85	6.3	18.5	35
	3					7.92	4.9	16.2	34	7.83	5.1	18.5	34	7.87	7.4	18.1	34	7.86	6.5	18.5	34
20	1	8.09	9.2	17.6	34	7.92	4.9	16.4	34	7.73	4.8	18.6	34	7.75	5.8	18.3	34	7.79	6.1	18.6	34
	2					7.93	4.9	16.4	34	7.69	4.7	18.5	34	7.70	5.3	18.2	34	7.75	6.1	18.6	34
	3					7.93	5.0	16.2	34	7.68	4.8	18.5	34	7.68	5.1	18.2	34	7.74	6.0	18.5	34
Min		8.07	9.0	17.5	34	7.92	4.9	16.2	34	7.68	4.7	18.4	34	7.68	5.1	18.0	34	7.74	5.7	18.5	34
Max		8.09	9.2	17.6	34	8.11	7.8	16.5	34	8.09	6.8	18.6	34	8.00	8.0	18.4	34	7.87	6.5	18.7	35

Note: — = All animals dead.

APPENDIX TABLE 8

Mysidopsis bahia
SURVIVAL DATA FOR REFERENCE TOXICANT (S.D.S.) TEST

Concentration (mg/L)	Rep	Initial Added	Day 1	Day 2	Day 3	Day 4	% Survival	Average % Survival
0.7	**1**	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	10	9	9	90	96.7
1.25	**1**	10	10	10	10	10	100	
	2	10	10	10	9	9	90	
	3	10	10	10	10	10	100	96.7
2.5	**1**	10	10	10	10	9	90	
	2	10	10	10	10	10	100	
	3	10	10	10	10	10	100	96.7
5	**1**	10	10	10	10	10	100	
	2	10	10	10	10	10	100	
	3	10	10	9	9	9	90	96.7
10	**1**	10	10	10	9	8	80	
	2	10	10	10	10	10	100	
	3	10	10	10	8	8	80	86.7
20	**1**	10	2	1	1	1	10	
	2	10	7	6	6	6	60	
	3	10	8	3	3	3	30	33.3

Note: — = All animals dead.

ATTACHMENT 2

7 July 1995 Memo from EPA

Waiving Requirements for Mussel Larvae

Bioassay Test for 23 June 1995 Sampling

OPINAP FAX TRANSMISSION
USEPA Region 9
Office of Pacific Island and Native American Programs (E-4)
75 Hawthorne Street
San Francisco, CA 94105
FAX NO: (415) 744-1604
VERIFICATION NO: (415) 744-1599

DATE: July 7, 1995 **PAGES (incl. cover): 1**

TO: Kurt Kline
Advanced Biological Testing Inc.

FAX: 415/435-7882 **Phone: 415/435-7878**

SUBJECT: Bioassay Test of Cannery Waste on Bi-valve Larvae

FROM: Pat Young, American Samoa Program Manager
USEPA Region 9
Phone: (415) 744-1594

Amy Wagner discussed with me the problems you were having with spawning the mussel larvae necessary for conducting bioassay tests on the cannery waste, and whether you should continue with the tests even though the cannery waste sample is now over 10 days old. Although the sample has been stored properly and refrigerated, we are concerned that given its high organic content and the waste's tendency to increase its ammonia content over time, no meaningful comparison or correlation of results could be made among the results of bioassay tests conducted on mussel larvae using 10-day-old cannery waste and the results obtained with the sand dab and mysid using the fresh sample. Rather than having you conduct the entire series again with the three species using new samples, and given the unrealibility of the mussel spawning, we waive the requirement to conduct the bioassay test on the mussel larvae for this round of sampling.

Should you have any questions, please feel free to call me.

cc: Steve Costa, CH2MHill
Jim Cox, Van Camp Seafoods
Norman Wei, Star-Kist Samoa
Amy Wagner, EPA Lab
Alan Ota, EPA (W-3-3)
Sheila, Wiegman, ASEPA

Copy to Mike Allen Ota

MEMORANDUM CH2M HILL

TO: Pat Young/USEPA

COPIES: Eugenia McNaughton/USEPA
Norman Wei/StarKist Foods
James Cox/Van Camp Seafood
Sheila Wiegman/American Samoa EPA

FROM: Steve Costa/CH2M HILL/SFO

DATE: 7 August 1995

SUBJECT: **Summary of Ocean Dumping Modeling Results: Starkist Samoa, Inc. and VCS Samoa Packing**

PROJECT: 107091.DS.MD (OPE030702.DS.MD)

Purpose

The purpose of this memorandum is to provide a brief summary of the status of the modeling portion of the ocean dumping studies being conducted under Special Condition 3.3.5 of the Ocean Dumping Permits issued to StarKist Samoa and VCS Samoa Packing. A fully documented report incorporating all bioassay and modeling information is currently being prepared.

Modeling Scope

The modeling study has been done in three parts, as described in the study plan: [1] use of the bioassay results (described in a separate memorandum) with existing model results presented in Appendix B of the 1989 FEIS; [2] an evaluation of the existing model; [3] the development of a revised model approach more representative of changes in vessel characteristics and operational methods.

Existing Model

Based on the descriptions in the 1989 FEIS, the existing model was reproduced and tested. We were not able to exactly reproduce the model results for all cases and believe there are some errors, simplifications or inconsistencies in the original formulation. However, these errors are not "fatal" and generally not significant. The maximum disagreement between results from our formulation and the initial FEIS formulation of the model are on the order of 10 percent, and typically much smaller. Previous model predictions appear to have been

reasonable, and probably conservative, for the development of the ocean dumping siting and operational procedures.

Evaluation of the Existing Model

The existing model was developed based on a previous vessel using a different operational mode of discharge, than currently used. CH2M HILL has considered the current vessel and operational procedures. Based on our evaluation of the existing model, including the possible errors mentioned above and the changes in discharge operation, we believe a revised model is appropriate. The revisions should account for both the discharge of the material directly between the two counter rotating propellers of the Tasman Sea and a more sophisticated approach to dilution in the propeller slip stream. Subsequent dilution can then be calculated following methods similar to those used previously.

Summary of New Model Predictions

The new model developed by CH2M HILL consists of three parts:

- Dumping dilution - results from the initial discharge into the propeller wash and is numerically equivalent to the propeller discharge rate plus the waste discharge rate divided by the waste discharge rate

- Nearfield Dilution - results from the entrainment of seawater into the momentum jet from the propellers which contains the waste discharge

- Farfield Dilution - results from the subsequent dilution of the plume and is essentially the same model used previously.

The dilutions for the range of seasonal and operational parameters are as follows:

- Dumping dilution - ranges from approximately 350:1 to 400:1

- Nearfield dilution - is a function of distance from the vessel and is approximately 80:1 at 1000 feet from the vessel

- Farfield Dilution - depends on a number of environmental variables and can vary widely from season to season and from day to day; using the same dissipation coefficient used previously, the dilution predicted between end of the nearfield zone and the edge of the dump zone is approximately between 20:1 and 50:1

Preliminary Results

The dilutions described above are developed in a multiplicative fashion where the dilution is applied to the concentrations at the beginning of the individual mixing processes. Thus the overall dilution at the edge of the dumping zone is the product of the numerical values provided above. The preliminary results of the model predict dilutions of > 500,000:1 at the edge of the dumping zone. This number will be most sensitive to the assumptions made for the farfield dilution portion of the model. However, even the most conservative assumptions will result in dilutions on the order of 100,000:1 at the edge of the designated dumping area. Discounting any subsequent dilution still results in predicted dilutions of greater than 25,000:1 at a distance 1000 feet downstream of the vessel. All dilutions are considered along the plume centerline and average dilutions are much smaller.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

January 5, 1994

Steven L. Costa
Project Manager
CH2M Hill
P.O. Box 12681
Oakland, CA 94604-2681

Re: Additional Comments to Draft Study Plans for Joint Cannery Ocean Disposal Modeling Re-evaluation

Dear Steve:

Attached are comments recently received from Walter Frick on the draft study plan for the modeling re-evaluation of ocean disposal of cannery fish waste. I forward these to you for your information and for your consideration when developing the more sophisticated model referenced in the plan.

Please call me at 415/744-1594 if you have any questions.

Sincerely,

Pat Young
American Samoa Program Manager

Enclosure

cc: Jim Cox, Van Camp Seafood Company
Norman Wei, StarKist Seafood Company
Tony Tausaga, American Samoa EPA
Sheila Wiegman, American Samoa EPA

bc: Dave Stuart, W-7-1, Mike Lee, E-4, Allan Ota, W-7-1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT

ENVIRONMENTAL RESEARCH LABORATORY - NARRAGANSETT
HATFIELD MARINE SCIENCE CENTER
NEWPORT, OREGON 97365

December 17, 1993

MEMORANDUM

PACIFIC ECOSYSTEMS BRANCH
TELEPHONE: (503) 867-4040

SUBJECT: Review of Study Plan for Joint Cannery Ocean Dumping Studies in American Samoa

FROM: Walter E. Frick
Physical/Chemical Processes Team

TO: David Stuart
Region 9 (W-7-1)

The study plan consists of two parts; Part I describes bioassay toxicity tests, and Part II describes a modeling re-evaluation. I asked Janet Lamberson, one of our biologists working with amphipods, to comment on the first part. She concluded that the proposed bioassay toxicity testing plan appeared reasonable.

Concerning Part II: Without benefit of the references, I understand that fish processing wastes will be discharged from a moving vessel. The waste will be dispersed by a combination of wake mixing (including propeller action) and passive diffusion.

As I understand it, the first phase of the model re-evaluation concerns previous modeling work based on Brooks' 4/3 power law dispersion model, which is seen to be overly conservative because it includes only lateral diffusion. The re-evaluation will reestablish this model and compare results with previous findings. The bioassay tests done under Part I will be used to determine whether predicted dilutions allow survival of the test species.

Phase 2 of Part 2 is confusing. It appears to be a critique of the previous modeling approach. The earlier model and assumptions will be re-evaluated. Appropriately, the omission of longitudinal and vertical dispersion, settling, and flotation are noted. That is straight forward enough. What is not clear is what is proposed under re-evaluation of "assumptions and methodology used to chose [sic] the magnitudes of the variables describing the important physical processes." The sensitivity analysis that follows is reasonable.

Phase 3 of Part 2 will produce a new, presumably better, model. It is anticipated that the new model will be less conservative. Presumably, the authors suspect that the previous model will show, incorrectly, that standards will be exceeded. Thus, a less conservative but also more accurate model is necessary. The two approaches will be compared and "predictions will be justified and explained."

How will the differences be justified? The authors note that "Typically a set of field data is used to determine the correct values to use for the coefficients. However, this is beyond the scope of the present study and there is little or no available and appropriate data for this task." In other words, the new model cannot be verified. As such, all the talk about sensitivity is rather meaningless.

The Brooks' 4/3 power law is part of the EPA PLUMES dilution model (Baumgartner, Frick, and Roberts, 1993. Dilution models for effluent discharges, Second edition. EPA/600/R-93-/139), which includes UM and RSB. My suspicions are that the value of the dispersion coefficient that we recommend is overly conservative in many cases. It also employs only lateral diffusion. However, I suspect that since the coefficient is based on various experimental and field measurements that this one mechanism actually parameterizes longitudinal and vertical dispersion indirectly. In other words, by virtue of the fact that the coefficient is derived empirically, the other mechanisms are represented. Thus, to make their effort credible, the authors really need to find some data to verify the changes they propose.

cc: David Young

WEF:ts

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

December 10, 1993

Steven L. Costa
Project Manager
CH2M Hill
P.O. Box 12681
Oakland, CA 94604-2681

Re: Comments to Draft Study Plans for Joint Cannery Ocean Disposal Bioassay Toxicity Tests and Modeling Re-evaluation

Dear Steve:

We have reviewed the draft study plans for the biotoxicity tests and modeling re-evaluation. Attached are comments on the bioassay toxicity tests which should be addressed before the plan will be approved. Questions regarding these comments should be addressed to Amy Wagner at (510) 412-2329. A final study plan should be submitted for approval upon resolution of these comments.

Due to the delay in submittal of the draft study plan, we are allowing the first sampling episode to occur in January 1994, rather than in November 1993, as indicated in the ocean disposal permits. Thus we approve your request that each of the subsequent three sampling episodes be delayed by the same amount to maintain the desired spacing. However, the completion date for the overall study will not be changed.

The modeling re-evaluation study plan is approved as submitted. However, as we previously discussed, the additional, more sophisticated model referenced in the plan has not been selected yet and will be submitted for EPA's review prior to its utilization.

Please call Pat Young at 415/744-1594 if you have any questions.

Sincerely,

Norman L. Lovelace, Chief
Office of Pacific Island and Native
American Programs (E-4)

cc: Jim Cox, Van Camp Seafood Company
Norman Wei, StarKist Seafood Company
Tony Tausaga, American Samoa EPA
Sheila Wiegman, American Samoa EPA

Attachment

bc: Robyn Stuber/Debra Denton, W-5-1
Dave Stuart, W-7-1
Mike Lee, E-4
Amy Wagner, P-3-1
Allan Ota, W-7-1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DEC 09 1993

SUBJECT: Review of Draft Bioassay and Modeling Re-evaluation Plans for Tuna Cannery Ocean Disposal Permits

TO: Pat Young
American Samoa Program Manager

FROM: Amy Wagner
Laboratory Section

Debra Denton, Permits Issuance Section, and I have reviewed Part I (Bioassay Toxicity Tests) in the above entitled document. We do not recommend approval of the plan until the following issues are addressed or considered. Any questions concerning these comments can be adressed to me at (510) 412-2329.

1.Introduction, I-1: Considering the nature of the waste discharge, we agree that the fish processing wastes should be considered as whole effluent and not tested in the suspended particulate phase.

2.Sample Shipping and Handling, page I-2: Understanding the logistical difficulties in shipping samples from the South Pacific, it should be recognized that a 10 day hold time could result in an increase or decrease of toxicity. It is likely that the BOD will increase over time as reflected by IDOD values determined in the last toxicity tests on cannery effluent. Every effort to minimize the hold time should be made.

3.Selected Species, page I-2: Holmesimysis costata may not be an appropriate surrogate crustacean due to the low test temperature required and the crustacean's sensitivity to aeration. The use of the 96-hour static renewal acute test with Mysidopsis bahia is recommended as a more representative tropical species relevant to the study area.

4.Sample Preparation, page I-4: Artificial sea salts for brine manipulations of effluents can often cause toxicity. Use of natural seawater brine effluents (obtained from freezing or evaporating natural seawater) is recommended.

5.Experimental Conditions, I-4: The dilution series proposed seems more appropriate than the permit requirements based on toxicity seen at low concentrations of the cannery effluent. This dilution series may have to be modified after the first round of testing.

6.Experimental Conditions, I-5: The test temperatures proposed for the crustacean and sea urchin bioassays are higher than standard method requirements. Tests with M. bahia and P. vannamei are run at 20C, while tests using S. purpuratus are normally run at 12-15C.

7.Experimental Conditions, I-5: Methods for fish, mysid, and sea urchin toxicity tests should be cited (manual or reference) in this section since all test conditions (ie. static renewals, number test organisms) are not listed.

8.Quality Control and Quality Assurance, I-5: Sodium chloride is not a standard reference toxicant used in marine fish and mysid tests. In addition, this salt may cause an osmoregulatory rather than a toxicity response in the test organism causing variable sensitivity and dose-responses. Sodium dodecyl chloride, copper sulfate, or zinc sulfate are recommended reference toxicants for these test organisms.

cc: Terry Oda, Chief
Permits Issuance Section (W-5-1)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105
November 16, 1993

MEMORANDUM

SUBJECT: Request for Review of Draft Bioassay and Modeling Re-evaluation Plans for Tuna Cannery Ocean Disposal Permits

TO: Janet Hashimoto/Dave Stuart
Oceans and Estuaries Section (W-7-1)

Allan Ota
Dredging Team (W-7)

Terry Oda/Debra Denton/Robyn Stuber
Permits Issuance Section (W-5-1)

Brenda Bettencourt/Amy Wagner
Laboratory Support Section (P-3)

FROM: Pat Young
American Samoa Program Manager (E-4)

Attached please find copies of the draft bioassay and modeling re-evaluation plans required by the canneries' reccently-issued ocean disposal permits. We would greatly appreciate your assistance in having the study plans reviewed by your appropriate staff. If additional background information is needed to assist in the review, please let me know.

Of particular note in these drafts are: 1) request for delay of sampling schedule for bioassays; 2) proposal of different organisms for bioassays; and, 3) use of an additional, more sophisticated model for the modeling re-evaluation study. I would greatly appreciate your staff's review of this draft and any comments to me by December 10th if at all possible. The first sampling for the biossay needs to be done by the end of January so that the study results will not be unduly delayed. Should the reviewer need to discuss the technical aspects of the proposal, he/she should feel free to contact Steve Costa of CH2MHill at (510) 251-2426, ext-2251. Please call me at (415) 744-1594 if you have any questions.

Thanks again for your assistance.

Enclosure

cc: Mike Lee (E-4)

Engineers
Planners
Economists
Scientists

November 12, 1993

PDX30702.DS.BP/.MP

Patricia N.N. Young
American Samoa Program Manager
Office of Pacific Islands and Native American Programs
U.S. Environmental Protection Agency
75 Hawthorne Street (E-4)
San Francisco, California 94105

Dear Pat:

Subject: **Draft Study Plan for Special Condition 3.3.5 Ocean Dumping Studies for StarKist and Samoa Packing, American Samoa**

Enclosed is a draft study plan for the bioassay and modeling re-evaluation studies required under the ocean dumping permits for the two canneries. We have suggested an alternative species for the Group 1 bioassays for reasons presented on page I-3 of the draft study plan. Because of the delayed submittal of the study plans it may be necessary to delay the first sampling if the study plan cannot be reviewed quickly or substantial changes are required. I do not see this as a problem and suggest delaying each of the three sampling episodes by the same amount to maintain the desired spacing. This will not delay the completion of the overall project. We can delay the sampling by up to two months or more and still finish the study well ahead of schedule.

Please call me if you have any questions. Comments should be addressed directly to me and copied to Norman Wei and Jim Cox. I have sent Sheila Wiegman at ASEPA the same information.

Sincerely,

CH2M HILL

Steven L. Costa
Project Manager

cc: Norman Wei/StarKist Seafood Company
James Cox/Van Camp Seafood Company

DRAFT STUDY PLAN

FOR

JOINT CANNERY OCEAN DUMPING STUDIES

IN

AMERICAN SAMOA

Prepared for

StarKist Samoa
(Permit OD 93-01 Special)

and

VCS Samoa Packing
(Permit OD 93-02 Special)

Prepared by

CH2M HILL

11 November 1993

STUDY PLAN
FOR
JOINT CANNERY OCEAN DUMPING STUDIES
IN
AMERICAN SAMOA

Special ocean dumping permits have been issued to StarKist Samoa, Inc. and VCS Samoa Packing, Inc. because the Regional Administrator of EPA Region IX has determined that disposal of fish processing wastes off American Samoa meets EPA's ocean dumping criteria at 40 CFR Parts 227 and 228. Special condition 3.3.5 of both permits requires bioassay testing of the waste from each cannery and a re-evaluation of the model previously used to predict concentrations of fish processing wastes disposed of at the designated site. A copy of this special condition is provided in Appendix 1 of the study plan.

The special permit condition addresses two distinct efforts: bioassay testing and model re-evaluation. Although the results of the bioassay testing will be used in the final steps of the model re-evaluation, the two parts of the study are quite different and are best described independently. Therefore, this study plan is presented in two parts:

- Part I: Plan of Study for Bioassay Toxicity Tests
- Part II: Plan of Study for Modeling Re-evaluation

The two portions of the study will be conducted independently except as noted above. References are provided separately for part of the study plan. Additional information is provided in Appendices.

Part I

PLAN OF STUDY FOR BIOASSAY TOXICITY TESTS

INTRODUCTION

Under special conditions 3.3.5 of the Ocean Disposal Dumping Permits, StarKist Samoa and VCS Samoa Packing are required to conduct and submit the results of toxicity tests on fish processing wastes generated at the permittees' American Samoa packing plants. The toxicity tests are to be initiated within 10 days following sampling on November 30, 1993, February 28, 1994, and May 31, 1994. The wastes to be tested include DAF sludge and other high strength waste streams that are barged to sea for disposal at the permitted dump site. This part of the study plan describes the methods proposed to conduct the bioassay tests. The results of the tests will also be incorporated into the modeling re-evaluation described below in Part II of the study plan.

General guidance for these tests is provided by USEPA (1991), ASTM (1992), and the EPA/COE "Green Book" (1991). Specific guidance for performing biological-effects tests for Ocean Disposal permits are outlined in Part III, Section 11 of the Green Book; *Evaluation of Dredged Material Proposed for Ocean Disposal: Testing Manual* (EPA and COE, 1991). However, the fish processing wastes to be disposed under this permits are not similar to solid dredged materials. The high strength waste materials are mostly liquid phase wastes which are positively to neutrally buoyant with a small fraction of negatively buoyant solid particles. This waste is not expected to behave in a fashion typical of solid, generally negatively buoyant, dredge spoil material when disposed of by dumping at sea. Therefore, the physical and chemical nature of the wastes requires modifications to the suspended bioassay tests as outlined in the Green Book.

The following Methods sections include the specific modifications required to properly evaluate the toxicity of the tuna cannery high strength wastes. A description of the proposed reporting schedule and format for the bioassay test results is provided in the Reports section.

SAMPLING METHODS

Sample Composition

High strength waste samples will be collected at each cannery from the existing sampling ports in the storage tank transfer lines. Three samples will be taken at 10 minute

intervals while waste is being transferred from the storage tanks to the barge. Samples for the bioassay tests will be composited from the three discrete samples. Waste from each cannery will be collected and shipped separately and shall not be combined.

Sampling Times

Sampling will be conducted on the following days, if possible:

- Tuesday, November 30, 1993
- Monday, February 28, 1994
- Tuesday, May 31, 1994

If a cannery is shut down, or material is not being transferred to the barge on that day, sampling will be done at the first available time.

Sample Shipping and Handling

EPA approved chain-of custody, sample shipping and handling, and record keeping will be conducted to preserve and monitor the integrity of the samples used for the required bioassays. Samples will be cooled at the canneries after collection and then packed in ice for shipment. The permit requires tests will be initiated within 10 days of sample collection. There are significant and well recognized problems with shipment of material from American Samoa. Every reasonable effort will be made to meed the required 10-day maximum holding time. If the holding times are exceeded for some reason, EPA Region IX will be contacted to determine if the tests should be initiated or if new samples should be collected and shipped.

TEST METHODS

Selected Species

The permit condition requires testing of three species selected from three groups listed in section 3.3.5 of the permit. We propose tests be conducted with the pacific mysid shrimp (*Holmesimysis costata*) juveniles, pacific sanddab (*Citharicthys stigmaeus*) juveniles, and purple sea urchin (*Strongylocentrotus purpuratus*) larvae. These species and life stages were chosen because they represent sensitive crustacean, fish, and zooplankton components of the marine community, tolerate laboratory conditions, and can be readily

tested as young life-stages. These species are also routinely used in conducting bioassays for the ocean disposal permit program. Of great importance are the practicality and year-round availability of the appropriate life-stages of all three of the above species.

The shrimp and fish species were selected from the lists (Group 2 and Group 3, respectively) specified in the permit special condition. The sea urchin species (*Strongylocentrotus purpuratus*) was not listed in the permit (Group 1). We have recommended a different species because it is important that the same species and life-stages be used for each test series conducted. Three test series of bioassays will be conducted over approximately 9 months. The rationale for recommending a different species is as follows:

- The mollusc species listed in Group 1 (*Mytilus* sp. and *Crassostrea* sp.) and the copepod (*Acartia tonsa)* are potentially difficult to obtain at the appropriate life stage at all of the times specified in the permit condition.

- Therefore, sea urchin larvae, also listed in Group 1, are proposed for these tests instead of mollusc or copepod because of their availability at all times of the year.

- However, the sea urchin specifically listed (*Trypneustes* sp.) is not readily available and may be difficult to obtain, particularly at the specific times as required in the permit and an alternate sea urchin species (*Strongylocentrotus purpuratus*) is recommended.

With a limited number of opportunities to evaluate the toxicity of the material to be disposed, it is important to compare the results of bioassay tests using the same species and life-stages.

If necessary, *Mytilus* sp. (mussels) will be used as a backup species to the sea urchin and white shrimp (*Paneaus vannamai*) will be used as a back-up test species for the mysid shrimp should the primary test species be unavailable at the time of the bioassays. All reasonable efforts will be made to consistently use the primary test species.

Acclimation and Holding

All test organisms will be brought into the laboratory and gently acclimated to test conditions and control water (dilution water) for a minimum of 24 hours prior to test

initiation. Salinity, temperature, and dissolved oxygen conditions during test organism holding and acclimation will be monitored to ensure proper acclimation is obtained prior to starting the bioassay tests.

Sample Preparation

Properly refrigerated wastewater samples will brought up to test temperature prior to further test solution preparation. If the salinity of the waste solution is greater than 2 grams per liter less than that of the disposal site receiving water, salinity of the test waste solution will be adjusted with anhydrous sea salts up to the receiving water salinity. Time will be allowed for waste solution pH and salinity equilibration prior to bioassay initiation. Similarly, test control water will be adjusted to appropriate test salinity prior to test initiation.

Initial dissolved oxygen demand (IDOD) has been determined to be a problem with cannery effluent and high strength waste streams. Preliminary IDOD measurements were done at the canneries in October of 1993. The results are given in Appendix 2 of the study plan. IDOD determinations will be conducted and recorded for the samples prior to the start of the bioassays. The results of these IDOD measurements will be used to determine sample dissolved oxygen (DO) conditions and aeration procedures required for the bioassays.

Experimental Conditions

Serial dilutions using filtered natural seawater obtained from the Bodega Bay Marine Laboratory, California will be prepared by volumetric addition of diluent and high strength waste effluents from each cannery. Glass graduated cylinders and other non-contaminating labware will be used to prepare the test solutions. The permit condition requires dilutions of 100, 75, 50, 25, 10, and 5% waste concentrations, as well as a control. Based on previous bioassay results for both the high strength wastes and the joint cannery effluent discharged through the outfall, we recommend that the dilutions used be concentrations of 50, 25, 10, 5, 2.5, 1.25, 0.62, and 0.31 % waste. Control water consisting of diluent water only will also be tested. Five replicate test vessels will be prepared for each test solution and control.

Test vessels will be maintained in controlled temperature incubators or water baths and allowed to acclimate to test conditions prior to the test initiation. Temperature, salinity,

pH, ammonia and DO will be measured prior to test organism assignment into the test vessels. If DO concentrations are less than 40-percent of saturation or less than 4 mg/liter in any test solution or control, aeration will be initiated sufficient to maintain adequate DO levels in all test vessels and in all test concentrations (and controls) to maintain DO concentrations at a levels sufficient to support the organisms. Test photoperiod will be controlled by automatic timers to ensure adequate light for the bioassays.

Test temperatures for the fish, crustacean, and sea urchin bioassays will be 15, 15 and 18 degrees celsius respectively. Salinity for these tests will be that of the receiving water at the disposal site. Test organisms will be randomly assigned into the test vessels. Test vessels will be covered with loose fitting glass or non-contaminating covers and placed into the temperature controlled incubators.

The bioassays will be conducted for 96 hours (4 days). Daily observations to enumerate live fish and mysids and to monitor water quality parameters will be conducted throughout the bioassays. Equal volumes of food will be added to only the mysids to reduce cannibalization of this species within the test vessels.

The effect measured in the fish and mysid bioassays is mortality as defined as: no observed movement exhibited by the test organism after gentle swirling of the test container or probing. The test endpoint for the sea urchin larvae bioassay is mortality and/or larval abnormality as compared to the control organisms.

QUALITY CONTROL AND QUALITY ASSURANCE

The quality assurance objective is to characterize the potential toxicity of each of the canneries high strength waste to marine organisms by collecting bioassay test data of known and acceptable quality. The qualifications of the laboratory and personnel conducting the tests is provided in Appendix 3. The procedures described in the Test Methods section above describe the QA/QC procedures for sampling, analytical procedures, equipment calibration, sample custody, and data reduction and analysis.

Mortality in the controls of less than 10-percent in the fish and crustacean tests and 30-percent in the sea urchin tests after 96 hours will indicate successful tests. If these criteria are not met then EPA will be consulted to determine whether additional tests should be considered. Concurrent reference toxicant tests with the fish and mysid test species will be conducted using sodium chloride and reference toxicant tests with the sea urchin will use copper sulfate solutions with test concentrations bracketing the known

acute toxic concentration (LC50) for each species tested. These tests will be conducted for a 24 hour duration. If the concurrent reference toxicant test LC50 falls within ±2 standard deviations of the testing laboratory's cumulative sum LC50 for that species the tests will be considered acceptable.

DATA ANALYSIS AND REPORTING

Test data analysis and calculations

Acute mortality and/or larval abnormality data will be used to calculate an acute median lethal (LC50) or effect (EC50) concentration. A computer program (TOXDAT) will facilitate the calculation of the 96 hour LC50 (or EC50 for the zooplankton tests) by either: Probit, Spearman-Karber, or the Trimmed Spearmean-Karber Methods. The analysis used will depend on the distribution of the mortality data obtained from these toxicity tests. These LC50 or EC50 values will then be used to calculate Limiting Permissible Concentrations (LPC's).

Reports

A report of the results of the bioassay tests will be prepared following each of the tests. The report format will be as described in the permit conditions (Sections 3.3.5.1 through 3.3.5.5). Specific information including bioassay materials and methods, sampling procedures, results, data analysis, and discussion will be included in the report. General guidance for the bioassay reports will be that of EPA (1991).

REFERENCES

American Society for Testing and Materials, ASTM. 1992. Standard Practice for Conducting Static Acute Toxicity Tests with Embryos/Larvae of Four Species of Saltwater Bivalve Molluscs. Designation E724-92. Annual Book of Standards, Vol:11.04. ASTM, Philadelphia, PA.

United States Environmental Protection Agency. 1991. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027. September 1991. 293 pp.

United States Environmental Protection Agency, United States Army Corps of Engineers. 1991. Evaluation of Dredged Material Proposed for Ocean Disposal: Testing Manual. EPA-503/8-91/001. February, 1991.

Part II

PLAN OF STUDY FOR MODELING RE-EVALUATION

INTRODUCTION

Permit condition 3.3.5 of the Ocean Disposal Dumping Permits for StarKist Samoa and VCS Samoa Packing requires that the bioassay results be used re-evaluate the previous model predictions of dispersion of the plume created by dumping fish processing wastes at sea. The previous predictions are presented in the FEIS (EPA, 1989) and in a supplementary study (SOS, 1990). A field study of the fate of the wastes is described by Soule and Oguri (1983). A description of the previous model and the details of the past modeling results are found in Appendix B of the FEIS.

We propose to conduct the model re-evaluation in three phases:

[1] The existing model formulation, as described in the 1989 FEIS (Appendix B) will be used "as is" with model predictions evaluated using the new bioassay test results. Any differences in conclusions between earlier work and the reevaluation will be presented and discussed.

[2] The input data and assumptions used in the model will be examined and evaluated. Sensitivity studies will be done for critical parameters, including assumed values for diffusion coefficients, initial dilution, and ambient conditions. The appropriateness and applicability of previously assumed values will be discussed.

[3] A different, more sophisticated model(s), and/or modifications to the previous model, using appropriate assumptions, will be applied as an independent check of the previous model predications. The model selection will be based on the results of step [2] above. The objectives of the re-evaluation with a different model is to account for changes in vessel characteristics and operational methods and to develop a more representative model.

The previous model, based on an approach originally developed by Norman Brooks, is typically very conservative in similar applications. Other assumptions in the model are also conservative. The use of a different or modified model will allow an evaluation of the degree of conservatism being applied. The initial dilution assumptions will also be

examined. The propeller stream of the vessel will be modeled, using an established model developed at Texas A&M and modified by CH2M HILL, to assess the actual degree of the initial mixing. Conclusions and recommendations will be presented based on the independent assessment. The three phases of the model re-evaluation are described below.

MODELING METHODS

Re-evaluation of Previous Model Predictions

The results of the previous model are presented in terms of dilution (or concentration) of fish processing waste versus distance from the initial dump site. Based on the results of the bioassay tests, the distance from the dump site where the effluent is diluted to the limiting permissible concentration (LPC) level can be determined.

The previous model provided results parametricly with assumed ocean current speed, pumping rate, settling velocity, and other variables. The re-evaluation will examine the range of ambient receiving water conditions, pumping rates, and effluent characteristics for the new bioassay results to determine worst case conditions.

Appropriate changes in model input parameters, such as vessel beam, vessel speed, or pumping rate, will be incorporated but the model formulation will remain as originally developed. A verification run using identical input for a previous model run will be done to confirm the same formulation is being used. A discussion of any differences between previous predictions and those for the new bioassay test results and compliance with permit conditions will be developed from the results of this phase of the model re-evaluation.

Re-evaluation of Model Assumptions and Input

The model assumptions and input can be considered in three categories:

- Model formulation assumptions: assumptions involved in the basic formulation of the model involving the fundamental physics and mathematics used

- Model development assumptions and input: the assumptions and methodology used to chose the magnitudes of the variables describing the important physical processes

- Model execution assumptions and input: the values used for the description of ambient conditions and characteristics of the waste material.

Each of these categories of model assumptions and input will be examined and re-evaluated. Each of the categories of assumptions and input is discussed in more detail below. In addition to the direct re-evaluation of the model assumptions and inputs, the sensitivity of the model will to important variables will be assessed. The results of the model predictions, and the conclusions drawn from the previous model results (for previous bioassay tests and the new bioassay tests) will be examined and discussed in terms of model assumptions and inputs. Evaluations of the degree of conservatism in the previous model formulation and execution will be presented.

Model Formulation Assumptions. The previous model formulation was based on the approach presented by Brooks (1960), and is essentially the same basic model as CDIFF (Yearsley, 1989). The formulation developed by Brooks calculates the lateral diffusion of a discharge plume as it is advected in the longitudinal direction and does not account for longitudinal dispersion.

As initially developed by Brooks, the approach does not account for vertical diffusion, does not provide for the settlement of negatively buoyant constituents in the plume, and does not account for the dispersion of a positively buoyant plume or positively buoyant components of the discharged material. In addition the model, as implemented in the FEIS, assumes a line source of constant source strength and does not simulate the discharge from a vessel traveling in an arbitrary path for a finite length of time.

The FEIS model provides for a settling velocity by redefining the longitudinal coordinate at a downward angle defined by the relationship between the longitudinal current speed and assumed vertical settling velocity such that:

$$x' = x \cdot \cos(\theta)$$

where

$\theta = \tan(u/w_s)$

u = ambient horizontal, longitudinal velocity

w_s = settling velocity

The FEIS model also accounts for vertical diffusion by applying a concentration reduction factor based on a Fickian diffusion coefficient (K_v). This factor is applied to the calculated centerline concentration (C_{max}) by

$$C_{max} \cdot \{(H/4) \cdot (2 \cdot K_v \cdot t + H^2/16)^{-0.5}\}$$

to calculate an adjusted value of C_{max} accounting for vertical diffusion, where H is the initial vertical plume dimension and t is travel time along the plume trajectory.

Each of the basic assumptions of the model and the modifications made for the FEIS model, as discussed above, will be evaluated. In particular the assumption of a continuous line source will be examined and the implications of applying the model to a source discharge of a finite time interval will be evaluated.

Model Development Assumptions. The values chosen to describe the physical processes will be evaluated. These values include the lateral and vertical diffusion coefficients. In addition the model formulation assumptions include the spatial and temporal scales over which the model predictions are used.

Model Execution Input Variables. The previous model input variables, not discussed in the model assumptions section above, include ambient current speed, initial dilution, settling velocity, and initial plume dimensions. An evaluation of the methodology and assumptions used to select the values used for these variables will be done. Changes in the values due to changes in vessel and operational procedures will be addressed. This evaluation will be extended by the sensitivity study descried below.

Model Sensitivity. The sensitivity of the model to each of input variables and to assumptions about the parameters used to describe the physical processes will be evaluated. This will be done by running the model for a range of values.

Development of Independent Model

An independent model will be developed and used to evaluate the dispersion of waste discharged from the barge. The purpose of this model is to provide a more sophisticated alternative to more realistically describe the fate and transport of the discharge. The model will, at a minimum, include the effects of diffusion in both horizontal directions

(longitudinal and lateral) and will model a discharge of finite time. In addition the model will account for the spatial pattern of the discharge.

The model will use initial dilutions as determined from the size of the propeller slipstream. Vertical diffusion will be accounted for using a technique similar to that used in the FEIS model. It is anticipated that the major difference in the model predictions will be reflected in the degree of conservatism involved in the model formulations and development. Any differences in model inputs and predictions will be justified and explained.

QUALITY CONTROL AND QUALITY ASSURANCE

The objective of the quality control and quality assurance (QA/QC) effort is to provide a high level of confidence that the models are providing physically realistic predictions. QA/QC will be achieved through use of the proven models executed by staff familiar with those models. Specific QA/QC measures include: validation of model code and that the models are providing physically realistic predictions, addressing a range of potential conditions where appropriate, sensitivity analyses, and documentation and maintenance of input and output files generated during modeling activities.
The models employed in the study are mathematical representations of physical processes. The mathematical equations used are solved numerically (approximate solutions) using a digital computer. It is important that this process, which is considerably removed from the actual physical processes and behavior of the ocean, accurately simulate what happens in the ocean. The process of validation uses representative parameters for simplified system configurations to determine if the predictions reflect reality. The process of validation begins as the initial model computer code is written and continues as long as the model code is used. It is particularly important that any changes in model code be checked for validity. The final element of validation is a determination of how sensitive a model is to changes in input parameters. An extremely sensitive model probably does not provide results with a high confidence level. Sensitivity checks will be carried out for each of the models for potentially critical parameters.

Most numerical models of the type used here contain coefficients (e.g. friction factors, diffusion coefficients) that are often study site specific. Although there are generally accepted values for these coefficients, the range observed in nature is high and the models can be somewhat sensitive to the values selected. The process of calibration and verification uses measured values of forcing functions and responses to determine the

appropriate coefficients for the model configuration at the study site. Typically a set of field data is used to determine the correct values to use for the coefficients. However, this is beyond the scope of the present study and there is little or no available and appropriate data for this task. In this case the model sensitivity studies, the use and justification of reasonable values for the literature and similar studies, and the incorporation of a prudent level of conservatism is required.

DATA ANALYSIS AND REPORTING

A report documenting the results of all analyses will be prepared. The report will include summaries of all input data, modeling procedures, and model results. All pertinent model results and output files (as appropriate) will be reproduced as an appendix to the report. Model results will be presented both in tabular form and graphically (i.e. contour plots) as appropriate. The report will include: an executive summary; an introduction describing the background, rationale, and general approach of the study; a description of the methods used including model formulation and input data; a description of the model results; an evaluation of the model validity for predicting dilution and plume characteristics; and, an evaluation of the concentration of the fish processing wastes within and at the boundary of the permitted ocean dumping site.

REFERENCES

Brooks, N.H., 1960. "Diffusion of Sewage Effluent in an Ocean Current," Proceedings of the First Conference on Waste Disposal in Marine Environment, Pergamon Press, NY.

SOS Environmental and Environmental & Ocean Technology, 1990. "Mathematical/Computer Modeling of Fish Waste Disposal at an Ocean Disposal Site off Tutuila Island, American Samoa". Report prepared for StarKist Seafood and Van Camp Seafood

Soule, D.F. and M. Oguri, 1983. "A report on Ocean Disposal of Fish Processing Wastes off Pago Pago , American Samoa. Report to EPA and NOAA for StarKist Foods and Van Camp Seafood. Los Angeles, California

U.S. Environmental Protection Agency, 1989. Final Environmental Impact Statement for the Designation of an Ocean Disposal Site off Tutuila Island, American Samoa for Fish Processing Waste. EPA Region 9, San Francisco, CA.

Yearsley, J.R., 1989. "Diffusion in Near-shore and Riverine Environments," EPA 910/9-87-168. EPA Region 10, Seattle, Washington.

APPENDIX 1
SPECIAL CONDITION 3.3.5

3.3.5. Eighteen months from the effective date of this special permit, the permittee shall submit a report to EPA and ASEPA on the results of suspended phase bioassay tests and reevaluation of the model used to predict the concentrations of fish processing wastes disposed at the designated site. The suspended phase bioassays shall be conducted using at least one species from each of the following three groups: Group 1 = *Mytilus* sp. (mussel), *Crassostrea* sp. (oyster), *Acartia tonsa* (copepod), or *Trypneustes* sp. (sea urchin) larvae; Group 2 = *Holmesimysis costata* (mysid shrimp) or *Penaeus vannamei* (white shrimp); and Group 3 = *Citharicthys stigmaeus* (speckled sanddab) or *Coryphaena hippurus* (dolphinfish) juveniles.

Appropriate suspended phase bioassay protocols, either protocols approved by EPA or protocols published by the American Society for Testing and Materials (ASTM), shall be followed. Suspended particulate phase bioassays shall be run using the following fish processing waste concentrations: 100%, 75%, 50%, 25%, 10%, 5%, and a control (0%). A minimum of five replicates are required per dilution concentration. Concurrent reference toxicant tests shall be conducted when the suspended phase bioassays are run.

A sampling and testing plan shall be submitted to EPA Region IX and ASEPA by October 1, 1993 for approval before the bioassay tests are conducted. Samples for the suspended particulate phase bioassays shall be composited from the permittee's onshore storage tanks. Three samples shall be taken from the onshore storage tank transfer line at 10 minute intervals. These samples shall be composited to produce one sample for analysis. The permittee's samples shall not be combined with fish processing waste from any other permittee. The permittee shall take samples on the following dates: November 30, 1993, February 28, 1994 and May 31, 1994. Samples shall be collected and shipped to the testing laboratory according to EPA-approved methods to

ensure that the samples do not change before the bioassay tests begin. All suspended particulate phase bioassays shall be started within 10 days of sampling.

The testing plan submitted by October 1, 1993 should also include a proposal to reevaluate the disposal site model using results obtained from the new series of suspended phase bioassays. These bioassays are being required to confirm the toxicity of the fish processing wastes and to reevaluate the disposal operations based on the use of a different disposal vessel.

The bioassay and computer model confirmation report shall contain the following information:

3.3.5.1. INTRODUCTION AND PROJECT DESCRIPTION

The project description should include the following information about fish processing waste toxicity, previous bioassay test results, previous modelling at the ocean disposal site, and the design of the new bioassay tests.

3.3.5.2. MATERIALS AND METHODS

Fish processing waste sampling and sample handling procedures should be described or referenced.

References for laboratory protocols for suspended phase bioassay tests.

1) EPA-approved methods and references.

2) Test species used in each test, the supplier or collection site for each test species, and QA/QC procedures for maintaining the test species.

3) Source of seawater used in reference, control and bioassay tests.

4) Data and statistical analysis procedures.

5) Limiting Permissible Concentration (LPC) calculations.

6) Description of model selected to evaluate dispersal of fish processing wastes at the ocean disposal site. Use of this model shall be approved by EPA Region IX and ASEPA before it is used by the permittee to evaluate the fish processing waste disposal plume.

3.3.5.3. DESCRIPTION OF SAMPLING PROCEDURES

QA/QC procedures and actual sampling procedures used during fish processing waste stream sampling and handling of the samples.

3.3.5.4. FINAL RESULTS, ANALYSIS OF DATA AND DISCUSSION

1) Complete bioassay data tables and summary bioassay tables shall be furnished in the report. All data tables should be typed or produced as a computer printout.

2) The permittee shall analyze the bioassay data and calculate the LPC of the material as defined at 40 C.F.R. § 227.27(a-b).

3) The permittee shall use the LPC in the approved plume model to determine the concentration of fish processing wastes disposed at the designated ocean disposal site which complies with EPA's Ocean Dumping Criteria defined at 40 C.F.R. Parts 227 and 228.

3.3.5.5. REFERENCES

This list should include all references used in the field sampling program, laboratory protocols, LPC calculations, modelling analyses, and historical data used to evaluate the fish processing waste disposal operations at the designated ocean disposal site.

3.3.5.6. DETAILED QA/QC PLANS AND INFORMATION

The following topics should be addressed in the QA Plan:

1) QA objectives.

2) Organization, responsibilities and personnel qualifications, internal quality control checks.

3) Sampling and analytical procedures.

4) Equipment calibration and maintenance.

5) Sample custody and tracking.

6) documentation, data reduction, and reporting.

7) Data validation.

8) Performance and systems audits.

9) Corrective action.

10) Reports.

APPENDIX 2
PRELIMINARY IDOD OBSERVATIONS

(THIS SECTION TO BE ADDED AND FAXED TO YOU 11/15/93

APPENDIX 3
LABORATORY QUALIFICATIONS AND QA/QC PROCEDURES

INTRODUCTION

Advanced Biological Testing Inc. (ABT) is a scientific consulting firm providing environmental and aquatic toxicological services to public and private clients. Established in 1993, ABT has a professional and technical staff of the highest caliber. The organizational, professional and performance history of our personnel attests to our commitment to focusing on the clients' particular requirements or problems.

ABT is a California corporation with laboratory and offices in Tiburon, California. It is a small, woman-owned business. ABT scientists have been involved in a wide variety of long-term projects, including the development of effluent characterization programs and the design and implementation of these programs. They have also participated in test protocol development programs for marine and freshwater toxicity testing. ABT personnel have conducted marine environment mitigation assessment studies; bay, harbor and marina activity impact analyses; and a wide variety of aquatic toxicological studies. Specific projects have assessed the effects of dredged material toxicity and disposal; assessment of toxicity from ocean and bay wastewater outfalls; drilling fluid toxicity testing and dispersant bioassays for the offshore oil and gas industry, and toxicity identification evaluations.

Our personnel have extensive experience in sampling in the marine environment; taxonomic analysis of marine communities; sediment characterization and toxicity assessment; and laboratory and field aquatic toxicity testing.

ABT provides a full-service aquatic toxicology laboratory with marine and freshwater test systems that can be modified on short notice for specialized and large-scale tests. The testing laboratory is fully equipped to conduct the entire range of freshwater and marine toxicity tests, including flow-through, static and static-renewal studies. Our personnel are knowledgeable in organizing, interpreting, and presenting large data sets as well as having thorough knowledge of data quality assurance, and analytical interpretation. Reports developed out of these efficient data analyses are of the highest professional quality and are delivered to the client in a timely manner.

ORGANIZATION AND QUALIFICATIONS

ORGANIZATION

Advanced Biological Testing Inc. (ABT) is a woman-owned business under the general management of Ms. Sandi Kline. The Technical Director and President is Dr. Kurt Kline, and the Project Manager is Mr. Mark Fisler. It is currently registering as a woman-owned business with the State of California.

QUALIFICATIONS

Ms. Sandra Kline: Ms. Kline is Executive Officer and General Manager of ABT. She has over twelve years experience in business including scientific consulting and commercial insurance. She manages the day to day operations of ABT including the management of subcontractors, in-house accounting, and contract management. In consultation with Dr. Kline and Mr. Fisler, she prepares bids as well as qualifications statements. She supervises the production of all technical reports for the company. She is a member of the Society of Quality Assurance and also acts as the QA supervisor for the testing carried out at the laboratory. She has taken and passed the EPA Society of Quality Assurance course.

Dr. Kurt F. Kline: Dr. Kline is President of ABT He received his doctoral degree from the University of California at Davis in Ecology in 1978, with a specialization in aquatic ecology, bio-statistics and fisheries biology. Dr. Kline has over twenty years of experience in the environmental consulting field, with the last ten years in aquatic toxicology and laboratory management. He has experience in all phases of aquatic bioassay testing, with specific expertise in sediment toxicity studies, including dredge material analyses. He is an active member of the American Society of Testing and Materials (ASTM) Committee E-47 as well as the Society of Environmental Testing and Analytical Chemistry (SETAC). He presents scientific papers at meetings and symposia annually.

Mr. Mark W. Fisler: Mr. Fisler is the Vice-President of ABT and serves as the Project Manager for the laboratory. He has been conducting marine biological research for eight years. He received his B.S. degree in Biology from George Mason University in 1984. As a Project Manager, Mr. Fisler has performed a variety of aquatic studies including numerous dredge bioassays. Mr. Fisler is responsible for field collection of sediments and water samples, and is experienced with a variety of collection apparatus.

QUALITY ASSURANCE PROGRAM

Quality assurance in all phases of the testing programs is an important function at ABT. Our goal is to generate irrefutable results for all of our clients, and the QA/QC program in place at our laboratory provides the documentation necessary to assure our clients that the data presented to them is of the highest quality. The QA/QC program extends from sample receipt to testing to statistical analysis of the data to the ultimate presentation of the final report.

- **Staff Responsibilities for Quality Assurance**
- **Sample Custody**
- **Quality Assurance Objectives**

STAFF RESPONSIBILITIES FOR QUALITY ASSURANCE

The responsibility for specific project management is established to maintain project timelines, efficient and cost effective testing, and report preparation. It defines the lines of authority and provides the client with the individual(s) responsible for their testing program. The following information provides the client with the duties and responsibilities for each key individual.

Technical Director

The Technical Director will represent management and will:

- Be the initial point of contact for the client.
- Assure that all necessary resources are available.
- Assure that the Quality Assurance Unit is fully informed and involved in the project.
- Assure that all personnel are informed of project QA policy.
- Review all communication from the QA regarding the project.
- Assure that any problems, deviations, etc., reported by QA receive immediate corrective action.
- Review and approve any QA plan.
- Be responsible for the preparation of the final report.

QA Unit

The QA Unit (QA) will be responsible to the Technical Director and will:

- Supervise audits and submit a summary audit report to the Project Manager.
- Assist in the preparation of any required project QA plan.
- Communicate closely with the Project Manager.
- Inform Project Manager and Technical Director of any problems and corrective action.
- Review data files, records, forms or any other hard copy information.
- Determine that analyses and procedures were done according to protocols.
- Document any deviations from standard procedures.

Project Manager

The Project Manager will be responsible for performing the toxicity tests and will:

- Be responsible for training of staff where required.
- Be responsible for sample custody and initial water quality analysis.
- Take corrective action for any problems observed and documented by QA.
- Maintain control of data files, notes, records and other hard copy information.
- Be responsible for sample and data traceability.

- Enforce protocol requirements.
- Help prepare the project QA plan.
- Ensure that QA receives sufficient documentation to determine that the project QA requirements have been satisfied.
- Analyze data collected for QA (external analyses, etc.) for inclusion in final report.

SAMPLE CUSTODY

All samples are maintained under chain-of-custody, which documents the acquisition, storage and testing of any sample received by the laboratory. This procedure provides the client with the highest level of security during the sampling, transportation and testing of their materials.

Sample chain-of-custody (C-O-C) sheets will be prepared by the individuals collecting the samples for those samples shipped from field test sites to ABT for testing. In the event that a chain-of-custody form is not provided to the laboratory, one will be initiated at the time the sample is delivered to the laboratory by the sample custodian. These C-O-C sheets will include the sample ID number, date and time of sampling, volume of sample, preservatives added (if any) and the analyses or tests to be performed. A brief description of each sample will also be included. The sheets will also include the identity of the person packaging the samples, the transportation method used and date of shipment. The original sheet will accompany the samples being shipped.

QUALITY ASSURANCE OBJECTIVES

Quality assurance procedures to be used for sediment testing are consistent with methods described in the U.S.EPA/ACOE (1991) and U.S.EPA (1985 a, b). The methods employed in every phase of this sediment testing program are detailed in standard protocols and procedures maintained in the bioassay laboratory.

The quality assurance objectives for toxicity testing conducted by ABT involve all aspects of the testing process including: (1) water and sediment sampling and handling; (2) source and condition of test organisms; (3) condition of equipment; (4) maintenance of appropriate testing conditions; (5) instrument calibration; (6) use of reference toxicants; (7) record keeping; and (8) data evaluation.

Water and sediment sampling and holding: Sediment samples will be maintained at 4°C in the dark until they are used in the testing system. All sediments will be held in sealed storage bags. Water and Effluent samples will be maintained for no more than 36 hours as specified by EPA procedures.

Source and condition of test organism: All test organisms will be purchased from reputable suppliers who have provided ABT with organisms in the past. Normally, all test organisms are maintained in the laboratory for acclimation (exception are bivalves and echinoderms). If mortality in excess of 5% is noted in the holding stock, the animals will be discarded and a new batch ordered.

Maintenance of test conditions: Each test has a set of specified test conditions as defined in the standard testing guide or protocol. The specific required parameter limits are generally noted in the section on the acceptability of the test. If these criteria are not met, the test will be rerun if appropriate.

Calibration procedures and frequency: Instruments are calibrated daily according to Laboratory Standard Operating Procedures (SOPs) and calibration data are logged and initialed. Calibration logs are monitored weekly to ensure that they are complete.

Reference toxicant testing: A reference toxicant will be run routinely during the test period to establish the validity of the toxicity data. Reference toxicant data for species used in the performance of aquatic bioassay are available at the laboratory, and the LC50 should fall within

two standard deviations of the current laboratory mean. Water quality measurements will be monitored to ensure they fall within the prescribed limits for each test procedure, and corrective actions will be taken if appropriate.

Test deviations: All deviations from the standard testing guide or procedure will be reported with the final report. If any aspect of a test parameter deviates from protocol, the test will be evaluated to determine whether its validity has been compromised according to the regulatory agency to which it will be submitted. If the study has been compromised, the client will be notified and the test rerun.

Internal quality control checks: The quality control unit conducts periodic audits to ensure that test conditions, data collection and test procedures are according to protocol. Animal receipt and maintenance log books are used to record the source and health of organisms. Reference toxicant tests act as an internal check on organisms health and performance during the test.

Sample storage and tracking: Sample chain-of-custody (C-O-C) sheets will be prepared for each of the samples shipped from the field to ABT for aquatic toxicity tests. These C-O-C sheets will include the sample ID number, date and time of sampling, volume of sample, preservatives added (if any) and the analyses or tests to be performed. A brief description of each sample will also be included. The C-O-C sheets will also include the identity of the person packaging the samples, the transportation method used and date of shipment. The original sheet will accompany the samples being shipped.

Upon receipt of any sample, laboratory personnel will enter the time and date of arrival, the identity of the carrier as well as the person receiving the samples, and the condition of the samples on the C-O-C sheet. All persons involved with sampling, transporting or receiving the sample will sign and date the C-O-C. A copy of the sheet will be returned to the client. The original C-O-C form will be kept for the study files. The samples will then enter into the laboratory sample control system to ensure proper storage ($4 \pm 2°C$) and holding time.

Under normal circumstances all aqueous samples will be immediately analyzed for dissolved oxygen, pH, conductivity or salinity, temperature, total residual chlorine and ammonia. These data are entered into the data package. If the results of this analysis lead the laboratory to suspect testing problems, the client will be called immediately and the potential problems discussed. No testing will be carried out without this verified communication process.

Data analysis, validation and reporting: All bioassay tests are performed according to protocols and standard test conditions. The quality control unit checks all the raw data and records of the study to ensure that the required test conditions are within specifications. Any unforeseen circumstances that may affect the integrity of the study are reported with the test results. The data analysis and final report are reviewed for accuracy by QA.

Procedures used to assess data precision and accuracy: The precision of the LC50 determination from the reference toxicant will be shown by calculating the 95 percent confidence intervals and standard deviations over time. Acceptable accuracy will be a mean reference toxicant value that is within two standard deviations of the current laboratory mean. A value greater than two standard deviations but less than three could be acceptable if the results of the sediment testing indicate that no significant sensitivity (or lack of sensitivity) was apparent in the testing.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL HEALTH AND ENVIRONMENTAL EFFECTS
RESEARCH LABORATORY
ATLANTIC ECOLOGY DIVISION
27 TARZWELL DRIVE • NARRAGANSETT, RI 02882

OFFICE OF
RESEARCH AND DEVELOPMENT

DATE: December 20, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report for EPA Region 9 - American Samoa Ocean Disposal Site for Fish Waste (comments on author's responses).

FROM: Mohamed A. Abdelrhman, Research Physical Scientist
Ecosystems Analysis and Simulation Branch, AED

Mohamed A. Abdelrhman

TO: Norman Lovelace, Chief
Office of Pacific Island Programs

Thank you for your kind response to my latest memorandum of October 30, 1996. Upon your request (your memorandum of November 19, 1996), my branch chief (Dr. Steve Schimmel) approved my continued participation in the technical assistance to Region 9.

I reviewed responses of Dr. Steve Costa, author of the report *"Joint Cannery Ocean Dumping Studies in American Samoa,"* to my technical comments (my memorandum dated September 3, 1996). In general the responses are favorable, however, some disagreements still exist. My acceptance, pending review of the revised report of the author's intended corrections (his memorandum of November 19, 1996) is indicated on the attachment by the word "accepted," unless otherwise indicated. I used the same system of titles and bullets used in the author's memorandum.

To me, and as I understand from Pat Young, time is a factor in this review process. To avoid any further delay, I hope that the concerns raised in this memorandum to be properly dealt with in the revised report. I also urge Region 9 to initiate a **field study** to provide validation data for this model. If you, Pat Young, Allan Ota, or Steve Costa have any questions or comments, please do not hesitate to call me at (401) 782 3182. I will be on annual leave December 22-29, 1996.

RECOMMENDATIONS:

(1) Region 9 should not accept this report until the requested revisions and/or explanations are provided by the contractor to EPA.

(2) Region 9 should support the conduct of a field study to validate the model results.

Again, if you have any comments or questions about my review, or if you request assistance in the development of a field study, please feel free to contact me.

ATTACHMENT: Comments on author's responses

Page 1 - Paragraph 1

Accepted.

Page 1 - Paragraph 2

[1] Partial acceptance

- Dumping dilution: state the equation for dumping dilution, and define all terms. A general reader of this report is not expected to put the time and effort I devoted to reproduce the results!
- Near field dilution: state the equations for A_o and Q_o and define terms (note: at x=0, Q_x=0)
- Accepted.

[2] State the values of I_1, I_2, and α.

[3] State the physical dimensions (units) at the first appearance of each parameter, coefficient, or constant and check the consistency of dimensionality of all equations.

[4] Accepted for "Dumping Dilution", but not accepted for "Nearfield Dilution" (see below).

[5] Accepted (I meant absolute error).

[6] Accepted, see [2] above.

[7] Refer to this memorandum for specific information to correct the existing errors in the report.

[8] Accepted.

Page 2 - Paragraph 1

- Accepted.
- Accepted.
- Accepted due to lack of field data. However, validation of model results is an essential part of any modeling exercise. A clear statement alerting the reader to the fact that all presented results are not yet validated is essential to avoid serious management decisions. I would urge Region 9 to initiate a field study to provide validation data for this model.
- Not accepted. Adequate number of graphs should be included in the report to illustrate method development (e.g., the three dilution zones) as well as results (e.g., as presented in Appendix B).
- Accepted.

Page 2 - Paragraph 2

[1] Equations for Dumping Dilution and Nearfield Dilution are already in the report. Include the equation for *Farfield Dilution* (from Appendix B, Equation 2.11) in the report to complete the picture.

- Accepted.
- Accepted.
- Accepted.

[2] Refer to comment above on adequate number of graphs.

[3] Accepted, see comment above on physical dimensions.

[4] Accepted, see comment above on physical dimensions.

Page 2 - Paragraph 3

Accepted.

Page 2 - Paragraph 4

[1] Accepted.

[2] Accepted.

[3] Accepted.

[4] Accepted.
[5] Accepted.
[6] Accepted.
[7] Not accepted. Refer to this entire memorandum to correct existing errors.
[8] Accepted, but order the information as: (1) illustration sketch of the two plumes, (2) Table of results, and (3) graph of clean parameter coefficient.

Page 2 - Paragraph 5

[1] No comments are presented on the three bullets. As I better understand the process, *Nearfield Dilution* has to be involved in this argument. The reason for the confusion between *Dumping Dilution* and *Nearfield Dilution* is the misplacement of the first paragraph in the *Nearfield Dilutions* section. This paragraph does not belong to this section, it belongs to the *Dumping Dilution* section, or maybe better to the *Revised Model Formulation and Prediction* section, or be eliminated. A graph (as requested above) of the three zones will clarify this issue. Note that the "hypothetical" velocity, V_A, of the ship was added to the whole setting to derive the equations. For *Dumping Dilution*, the author's argument is accepted that the discharged material will be spread over a volume, $\forall$, defined by $(1+b)V_A$ (i.e., the velocity relative to the vessel) and the propeller's area. But as soon as this is over, and at the onset of *Nearfield Dilution*, $\forall$ will travel at the real (not hypothetical) velocity relative to the ambient fluid, i.e., $(b\ V_A)$. The absolute velocity of $\forall$ can be identified using vector addition of $(b\ V_A)$ and the ambient current vector, but this is beyond the point. Actually, the vector difference between this jet-like velocity $(b\ V_A)$, and the assumed ambient currents (0.4 or 0.8 knots), is what causes entrainment of ambient fluid into the plume (jet mixing) in the nearfield. This entrainment produces the linear behavior of V_x with distance, x. The author should consult Figure 3.5 in Liu and Herbich (both the orifice and the ambient fluid are stationary), adding a hypothetical velocity to this system will not have any effect on the final result. Another way to view this is to consider an orifice moving (forward) at a velocity U while discharging (backward) at the same velocity in a quiescent ambient fluid. A parcel of water leaving the orifice at any time will have absolute velocity of ZERO, just like the ambient, and there will be no jet. In summary, The *Nearfield Dilution* values should be corrected by using the discharge velocity relative to the ambient fluid, not the vessel (i.e., $b\ V_A$).
[2] Aside from the rate of waste discharge, seasonality does not affect *Dumping Dilution* and *Nearfield Dilution*, but it affects *Farfield Dilution*. The reported *Dumping Dilutions* (Tables 4-1 and 4-2) are incorrect (see below).
[3] Accepted.
[4] Not accepted. Refer to [1].

Page 3 - Paragraph 1

Accepted.

Page 3 - Paragraph 2

[1] Include this justification in the report. The implemented approach is not conservative for reasons mentioned below. (e.g., assuming a 2.5 n mi to the edge of the dump site, instead of 1.5 n mi is not a conservative assumption).
[2] refer to [1].
[3] refer to [1].

Page 3 - Paragraph 3

Accepted.

Page 3 - Paragraph 4

- Accepted, see comment above on physical dimensions.
- Accepted.

- Accepted.
- Accepted.
- Accepted.

Editorial Comments on Marked Pages

- Accepted.
- Accepted.
- H is defined differently on pages 3-2 and 3-3. Present a consistent definition of H with illustration on the graph (sketch) of method development (as requested above). H should relate to the dimensions of the plume (or merged plumes) as indicated by the graph in the appendix for clean perimeter coefficient.
- Not accepted. The value of C_o is essential to define *Farfield Dilution* (see below). The exact value of this parameter has to be explicitly mentioned. Is C_o as defined by equation 2.1 in Appendix B, or by equation 3.1 in Appendix B, or set at an arbitrary value (i.e., 1000 mg/l) as used in Tables 4-1 and 4-2. The correct value of the initial concentration, C_o, should be the concentration value at the end of the nearfield dilution zone, i.e., at 1000 ft. Justification of the used value should be stated.
- Accepted.
- See comment above on physical dimensions.
- Not accepted. I will state my concerns for Tables 4.1 and 4.2:

    1. For the same ocean current (0.4 knots), vessel speed (6 knots), and loading rate (840 gpm) why is the *Dumping Dilution* for winter (796.2) is different than that for summer (931.6)? This error exists in all four dilution values for winter and their respective summer values.
    2. For the winter season: for the same vessel speed (e.g., 10 knots) why is the *Dumping Dilution* is the same (i.e., 731.4) for the two different loadings of 1200 gpm and 1400 gpm. The same question for winter with loadings of 720 gpm and 840 gpm. And the same for the summer season.
    3. *Nearfield Dilution* values should be corrected as mentioned above.
    4. Values in Table 4.1 should be calculated at 1.5 n mi not 2.5 n mi. The central zone of the dump site is the most conservative location for discharge, especially during windy conditions when current direction is not obvious to the barge captain.
    5. The text on page 3.8 indicate that *Nearfield Dilution* in Table 3.3 is for a single propeller as a function of "depth". "Depth" should be corrected to "distance". The results in the table indicate two propellers not a single propeller.

Additional Information

- Accepted.
- Accepted.
- Accepted, you mean K_o not K.
- The presented equations are empirical. The units used in the report are gpm (not cfs) for discharge, knots (not fps) for velocity. Refer to above comment on physical dimensions.

CC: Steve Schimmel, Acting Branch Chief, EAS, AED

Pat Young, American Samoa Program Manager, Region 9
Allan Ota, Ocean Dumping Program, Region 9
Janet Hashimoto, Region 9

ROUTING AND TRANSMITTAL SLIP

Date 11/14

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Allan		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Here's a draft (also emailed to you). Do you think we still need Mohamed's assistance?

Reviewed → OK

Conference call with Mohamed on 11/19/96

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Pat	Phone No.

5041-102

☆ U.S.G.P.O.: 1993 300-891/80018

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL HEALTH AND ENVIRONMENTAL EFFECTS
RESEARCH LABORATORY
ATLANTIC ECOLOGY DIVISION
27 TARZWELL DRIVE • NARRAGANSETT, RI 02882

OFFICE OF
RESEARCH AND DEVELOPMENT

DATE: October 30, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report for EPA Region 9 - American Samoa Ocean Disposal Site for Fish Waste

FROM: Mohamed A. Abdelrhman, Research Physical Scientist
Ecosystems Analysis and Simulation Branch, AED

Mohamed A. Abdelrhman

TO: Norman Lovelace, Chief
Office of Pacific Island Programs

Upon your request (your memorandum of August 19, 1996), I reviewed the report *"Joint Cannery Ocean Dumping Studies in American Samoa"*. My technical comments were sent to you approximately two months ago (my memorandum dated September 3, 1996). Asa you know, I recommended that major corrections be made to the report.

The time and effort I put into the review was granted by my branch chief (Dr. Steve Schimmel) as Technical Assistance to Region 9. The time allocated for reviewing the report is not always easy to obtain, especially since I have many other duties and responsibilities at the laboratory. Hence, it is very important for our laboratory to determine if: a) you received our review; b) our review was useful to Region 9; and c) these Region 9/AED interactions should be continued in the future.

At your convenience inform us of your comments on the above-mentioned review. Your comments are important to us for similar future activities. If you have any questions or comments, please call me at (401) 782 3182.

CC: Steve Schimmel, Acting Branch Chief, EAS, AED

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 14, 1996

MEMORANDUM

SUBJECT: Technical Review of Modeling Report of the American Samoa Ocean Disposal Site for Fish Waste

FROM: Norman L. Lovelace, Chief
Office of Pacific Island Programs

TO: Mohamed A. Abdelrhman, Research Physical Scientist
Ecosystems Analysis and Simulation Branch, AED

Please accept my apologies for not acknowledging receipt of your technical comments on the report Joint Cannery Ocean Dumping Studies in American Samoa. Your review, conducted at our request, was very useful, as Region 9 does not have the technical expertise to review such documents, and we appreciated the quick response time. We should have acknowledged receipt of your comments in September, however, we had assumed your involvement would include review of the response by CH2M Hill to your comments. Perhaps that was an incorrect assumption on our part for which we apologize, and we would appreciate your continued assistance in this review.

Upon receipt of your comments, we reviewed them and forwarded them to Steve Costa, author of the study, for his review, response and revision of the study. We recently received his response (attached), in which he addresses your comments and proposes changes to the report. However, he states that in order to respond in more detail to some of your comments, he needs more information from you. Additionally, he will issue a revised report upon our approval of his proposed changes and responses.

Thus, in response to your memo of October 30th, we certainly would like to be able to continue receiving technical support from the Atlantic Ecology Division, as well as from other EPA research laboratories which have expertise in areas that Region 9 does not. If you are able to continue to assist us in the review of this study it would be much appreciated. My staff, Pat Young, American Samoa Program Manager (415) 744-1594 and Allan Ota of the Ocean Disposal Team (415) 744-1980, will contact you soon to discuss this. Please call me at (415) 744-1599 if I can be of assistance.

cc: Steve Schimmel, Acting Branch Chief, EAS, AED

bc: Janet Hashimoto